

# Strategic Plan

## 2000–2005

### 2003 Update



**Healthy Missourians Living in an  
Environment that is Safe, Supportive,  
and Conducive to a Healthy Lifestyle**



## From the Interim Director



The Missouri Department of Health and Senior Services is responsible for protecting and promoting the health of all Missourians, at every stage in their lives. Our 2003 Strategic Plan reflects this charge as outlined in our vision -- *Healthy Missourians Living in a Safe, Supportive Environment that is Conducive to a Healthy Lifestyle.*

Highlighting our responsibility to Missourians of all ages, our strategic plan is organized around five result areas:

- Healthy Infants and Children
- Healthy Adolescents
- Healthy Adults
- Healthy Seniors
- Safe, Supportive Environment

For each result area we offer an overview that briefly explains the importance of the result, why it is a critical issue for Missouri, and success indicators that we will use to measure progress. Annual targets out to 2005 represent objectives that we've set for each of the success indicators.

We also include trends for the issue, as well as how Missouri compares with other states or the nation as a whole. Most important, we identify interventions that work for the success indicators, along with the Department's strategies for supporting them. A short description of each intervention makes it easier for partners and local communities to work with us toward these common outcomes.

The Department of Health and Senior Services is committed to evaluating the results of our work. Look for a report of progress on this plan in the department's annual report that will be available in January.

A handwritten signature in black ink that reads "Ronald W. Eaton".

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## Vision

Healthy Missourians living in an environment that is safe, supportive, and conducive to a healthy lifestyle.

## Mission

Department of Health and Senior Services protects and promotes quality of life and health for all Missourians by developing and implementing programs and systems that provide:

- Information and education
- Effective regulation and oversight
- Quality services
- Surveillance of diseases and conditions

We use strategic leadership and partnership, while promoting community participation in programs and systems, in order to accomplish outcomes and objectives.

## Values

In pursuing our mission, we value:

**Excellence** — We strive for excellence in services to our customers and in leadership throughout the public health and senior services system.

**Responsiveness** — We are committed to a strong, responsive public health and senior services system that meets the challenges of promoting and protecting the public's health and adapts to a rapidly changing environment.

**Diversity** — We believe that public health and senior services must meet the needs of diverse communities. We are committed to diversity in our workforce, which results in greater creativity and customer focus.

**Accountability** — We respect the valuable resources entrusted to us. We are committed to fiscal and program accountability and evaluating our performance in terms of benefit to the public.

**Integrity** — We are committed to treating all people honestly, fairly and respectfully.

**Teamwork** — We are committed to working in collaboration with others who can develop, maintain or enhance public health and senior services to the citizens of Missouri.



# Healthy Infants and Children

- Overview
- Success Indicators
- Interventions
  - Healthy Pregnancy
  - Breastfeeding
  - Immunization
  - Nutrition
  - Physical Activity and Nutrition
  - Lead Poisoning
  - Asthma

# Healthy Infants and Children - Overview

## Success Indicators :

- Percent of women smoking during pregnancy
- Percent of pregnant women accessing prenatal care in their first trimester of pregnancy
- Percent of live births that result in healthy birth weight babies.
- Percent of infants being breastfed at hospital discharge and to at least 6 months of age
- Rate of immunization for two-year olds
- Percent of children who are overweight or at risk for overweight
- Rate of lead poisoning (levels greater than 10 micrograms/deciliter) in children less than 72 months of age
- Rate of hospital emergency department visits for asthma for children aged 1-4

## Why is the health of infants and children important?

The health of infants and children

- affects their growth and development
- predicts their health as adults.

The foundation for the health, growth, and development of infants begins during the preconceptional period and continues throughout the first years of life. Inadequate health care, unhealthy environments or poor nutrition predispose children to health problems that may compromise growth and development.

With an unintended pregnancy the mother is less likely to seek prenatal care within the first trimester and more likely not to obtain prenatal care at all. She is less likely to breastfeed and more likely to expose the fetus to harmful substances, such as tobacco or alcohol. Early and adequate prenatal care is imperative for ensuring the best possible outcome for the infant and mother.

Health behaviors and health status of both parents affect infant survival and childhood development beginning in the preconception period. Babies born to inadequately nourished mothers are at increased risk for prematurity, low birth weight, being small for gestational age and birth defects. The use of illegal drugs, such as cocaine, while pregnant increases the risk for prematurity, low

birth weight, and infant death. Smoking while pregnant doubles the risk of having a low birth weight baby. Babies born at low birth weight require monitoring, and in many cases specialized medical care.

Breastfeeding reduces the incidence of childhood illness, supports infant growth, and prevents acute and chronic illness. Babies who are breastfed have been shown to have lower rates of allergies and illnesses throughout life.

A child's greatest degree of growth and development between birth and adolescence takes place during the child's first five years. By the time the child is five years old, for example, the brain will have reached 90% of its adult weight. A major determinant of health status for young children, including infants, is poverty. An estimated 17.7% of Missouri children under the age of 19 live in poverty. This contributes to disparities in health status and health care access for Missouri children.

During childhood, the health habits and other behavior patterns that persist through life are developed.

## Why is the health of infants and children a critical issue for Missouri?

The health of Missouri's infants and children sets the stage for the health of future generations.

### • Preconception and Pregnancy

- ✓ Each year in Missouri, about 12 infants are born with anencephaly and 50 with spina bifida, two common neural tube defects. Many of these defects could be avoided if women of childbearing age consumed 400 micrograms of folic acid supplements daily.
- ✓ Cigarette smoking contributes to an estimated 10% of infant deaths and 30% of low birth weight infants.
- ✓ 18.3 % of pregnant women in Missouri report smoking during pregnancy.
- ✓ Nationally, smoking-attributable neonatal expenditures were \$366 million in 1996, or \$704 per maternal smoker.

## Healthy Infants and Children - Overview

- **Infants**

- ✓ The African-American infant death rate (14.8) was 2.5 times the white rate (5.9) in 2000.
- ✓ 38.6% of African-American infants were breastfed at hospital discharge compared to the 74.9% Asians, 38.6 Hispanics, and 61% Whites in 2001.

- **Children**

- ✓ Statewide immunization rates for children 19-35 months improved from 64% in 1994 to 75.5% in 1999 for the complete series of shots. In 1999, Missouri rates were still below the national immunization rates for children.

- ✓ Only 1 in 5 children eat the five or more recommended servings of fruits and vegetables per day.
- ✓ Overweight among children is reaching epidemic proportions. In Missouri in 2000, 11.5% of children 2-5 years old enrolled in WIC were overweight. 15.4% of that same group were at risk for overweight.
- ✓ Only 9% of Missouri children received a blood lead test during 1997. Of those, 14% had blood lead levels of  $\geq 10$  mcg/dl.
- ✓ In 1998, Blacks in Missouri, had a higher prevalence rate of asthma (11.6%) than Whites (7.5%) and Hispanics (6.9%).

Success Indicators	Healthy People 2010	2000 Baseline	2001 Target	2002 Target	2003 Target	2004 Target	2005 Target
Percent of women accessing prenatal care in their first trimester of pregnancy	90.0%	86.1%	85.7% (Actual)	86.2%	86.7%	87.4%	88.2%
Percent of women smoking during pregnancy	2.0%	18.3%	16.8%	15.7%	15.7%	14.6%	13.5%
Percent of live births that result in healthy birth weight babies	N/A	90.3%	90.5% (Actual)	Maintain at 90%+	Maintain at 90%+	Maintain at 90%+	Maintain at 90%+
Percent of infants being breastfed at hospital discharge	75.0%	57.6%	58.8%	60.0%	61.0%	62.0%	63.0%
Percent of infants breastfed to at least 6 months of age	50.0%	26.7%	27.0%	27.5%	28.0%	28.5%	29.0%
Immunization coverage rate for two-year olds	80.0%	79.0%	78.0%	80.0%	81.5%	83.0%	84.5%
Percent of children (WIC 2-5 years old) who are overweight ( $\geq 95$ th percentile for BMI for age)	N/A	11.5%	11.7%	11.6%	11.5%	11.0%	10.8%
Percent of children (WIC 2-5 years old) who are at risk for overweight (85th to $\square$ 95th percentile for BMI for age)	N/A	15.4%	15.4%	15.2%	15.0%	15.0%	15.0%
Rate of lead poisoning (levels greater than 10 micrograms/deciliter) in children less than 72 months of age	0 (total elimination)	10.0%	6.0%	5.0%	4.0%	3.0%	2.0%
The rate of hospital emergency department visits for asthma for children aged 1-4	8.0/1,000 population < 5	16.2/1,000 pop.	15.5	14.8	14.1	13.4	12.7

\*Data not available

### References:

*Annual Smoking-Attributable Mortality, Years of Potential Life Lost, and Economic Costs—United States, 1995-1999.* MMWR April 12,2002, 51(14).  
 Institute of Medicine, 1995.  
 Missouri State Public Health Laboratory Metabolic Disease Unit.

# Healthy Infants and Children - *Healthy Pregnancy*

## Success Indicators :

- Percent of women smoking during pregnancy
- Percent of pregnant women accessing prenatal care in their first trimester of pregnancy
- Percent of live births that result in healthy birth weight babies

## What are the trends and how does Missouri compare to others?

Overall in Missouri more women are receiving adequate prenatal care (82.1%, 1990; 89.6%, 2000) and fewer women are smoking during pregnancies (21.7%, 1990; 18.3% in 2000).

### Prenatal Care Within First Trimester

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
All Races	83.6%	83.9%	84.3%	84.9%	85.6%	86.1%	85.7%
Whites	86.5%	86.9%	87.1%	87.4%	88.0%	88.3%	88.2%
Blacks	68.6%	68.4%	70.1%	72.1%	73.5%	75.1%	73.7%

Source: Missouri Department of Health and Senior Services, Missouri Information for Community Assessment (MICA).

### Percent of Live Births that Result in Healthy Birth Weight Babies

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Missouri Rate	90.1%	90.2%	90.2%	90.0%	90.2%	90.3%	90.5%
United States Rate	90.3%	90.3%	90.2%	90.2%	90.1%	NA	NA

Source: Missouri Department of Health and Senior Services, Missouri Information for Community Assessment (MICA).

### Overall Prevalence of Prenatal Drug Exposure

	<u>1993</u>	<u>1997</u>	<u>2001</u>
Any Drug	28.1%	23.8%	*
Illegal Drugs	10.8%	5.2%	*

\*Data available December 2002

Source: Prenatal Substance Abuse Studies, Center for Health Information Management and Evaluation.



## Interventions that work:

### *Maternal - Child Home Visiting*

Currently there are three maternal-child health home visiting models being used in Missouri:

The first is an evidence-based program - the Prenatal and Early Childhood Nurse Home Visiting Program based on the David Olds Model of home visiting. The model is a prevention program that helps low-income, first-time mothers deliver healthy babies, obtain proper care, and avoid substance abuse and criminal behavior. In this program nurse home visitors work with women and their families in their homes during pregnancy and the first two years of life to improve pregnancy outcomes, improve child health and development, and improve the family's economic self-sufficiency. The major problems targeted for prevention are: preterm delivery and low birth weight, child abuse and neglect, childhood injuries, rapid successive unintended pregnancies, reduced participation in the workforce, conduct disorder, and crime and delinquency.

The second, the Missouri Community-Based Home Visiting Program, is an interdisciplinary team intervention to provide family support through collaboration and research. The program was developed in 1996 through collaboration and research by the Missouri Department of Health and the University of Missouri, Sinclair School of Nursing. The program uses standardized protocols, standards of practice, and a multidisciplinary approach for public health home visiting in the context of family preservation and family support activities for families at risk. The model utilizes nurses and paraprofessionals and provides intensive sustained visits and coordination of community services over an extended period of time.

The third is a crisis intervention program which provides "safety net for families most at risk" to help prevent infant mortality, child abuse and neglect. This is done through in-home nursing visits providing health-care, and education and teaches positive parenting skills. The program provides home visitation services for families with no means of payment.

#### DHSS Strategy for Supporting the Interventions

1. Evaluate the effectiveness of the home visiting programs currently in use in Missouri and expand those determined to be most effective to targeted areas with identified high risk populations.

#### References:

*Enduring Effects of Nurse Home Visitation on Maternal Life Course, A 3 Year Follow-up of a Randomized Trial*, Journal of the American Medical Association, April 19, 2000, Vol. 283, No. 15, 1983-1989.

*Long-term Effects of Nurse Home Visitation on Children's Criminal and Antisocial Behavior, A 15 Year Follow-up of a Randomized Controlled Trial*, Journal of the American Medical Association, October 14, 1998, Vol. 280, No. 14, 1238-1244.

*Investing in Our Children, What We Know and Don't Know About the Costs and Benefits of Early Childhood Interventions*, The California Wellness Foundation, RAND, 1998, 77-89.

*Effect of Prenatal and Infancy Home Visitation by Nurses on Pregnancy Outcomes, Childhood Injuries, and Repeated Childbearing*, Journal of the American Medical Association, August 27, 1998, Vol. 278, No. 8, 644-652.

*The Impact of Nurse Home Visitation on Early Child Health and Development*, Georgia Academy Journal, Fall 1998, 2-5.

*Long Term Effects of Home Visitation on Maternal Life Course and Child Abuse and Neglect*, Journal of American Medical Association, August 27, 1997, Vol. 278, No. 8, 637-643.

*Effect of Prenatal and Infancy Nurse Home Visitation on Government Spending*, Medical Care, Vol. 31, No. 2, 155-174.

# Healthy Infants and Children - *Breastfeeding*

## Success Indicators:

- Percent of infants being breastfed at hospital discharge
- Percent of infants being breastfed to at least 6 months of age

## What are the trends?

Breastfeeding at hospital discharge has shown a steady increase from 1997 to 2001.

For women participating in the WIC program, the increase has been significant, from 37.5% in 1994 to 45.6 % in 2000.

## How does Missouri compare to others?

Percent of Infants Breastfed at 6 Months		
Year	Missouri	Nation
1996	17.2	21.7
1997	23.0	26.0
1998	23.1	28.6
1999	26.3	30.7
2000	26.7	31.4

Source: Mothers' Survey, Abbott Laboratories, Inc., Ross Products

Percent of Infants Breastfed at Hospital Discharge	
Year	Missouri Rates
1997	54.4
1998	55.5
1999	55.6
2000	57.8
2001	58.3

Source: State Public Health Laboratory Metabolic Disease Unit

## Reference:

Pediatric Nutrition Surveillance System.

## **Interventions that work:**

### ***Breastfeeding Lactation Program and Peer Counseling Program for Breastfeeding***

**I**ntegrating culturally appropriate breastfeeding curriculum into the training received by physicians and nurses is instrumental in supporting breastfeeding families during the prenatal and postpartum periods. In addition, the training provided enables physicians and nurses to address breastfeeding issues with women of childbearing age during routine examinations. Evidence-based feeding practices in delivery hospitals during the critical early days of an infant's life ensure that breastfeeding is successfully initiated prior to sending the mother and baby home. Continued support by well-trained health care professionals, peers, and family members is also essential during the entire breastfeeding period.

Limited studies indicate that the breastfeeding peer counselor program is effective in increasing breastfeeding initiation in specific populations, such as African-Americans and teens. Peer counselors provide information and support to pregnant women and new mothers who are considering breastfeeding or who have chosen to breastfeed. Peer counselors, who have previously breastfed, generally come from the same socio-economic background as the women they are counseling. Peer counselors receive 20 hours of

training prior to working with pregnant or breastfeeding women. While studies indicate that the infant's father and grandmothers are very influential in the decision of the family to breastfeed, there are no known interventions targeting fathers and grandmothers that have been evaluated for effectiveness.

In addition to the specific efforts made for initiating breastfeeding in the hospital and support upon returning home, public awareness of the benefits of breastfeeding is necessary. Women are more likely to breastfeed longer if their efforts are supported by their work place, public policies, and community attitudes regarding "normal" infant feeding.

#### **DHSS Strategies for Supporting the Interventions**

1. Improve health care practices through implementation of lactation curriculum in medical and nursing schools.
2. Compare and evaluate the educational approaches used to promote and support breastfeeding in Missouri's programs, such as Maternal-Child Home Visiting, Family Planning, and WIC to determine their relative effectiveness.
3. Develop and implement a pilot intervention to increase breastfeeding knowledge and support by family members who influence the woman's decision to breastfeed, such as partners and mothers.

## **References:**

U.S. Department of Health and Human Services. *HHS Blueprint for Action on Breastfeeding*, Washington, D.C., U.S. Department of Health and Human Services, Office on Women's Health, 2000.

Long, D.G. et al, *Peer counselor program increases breastfeeding rates in Utah Native American WIC population*, Journal of Human Lactation, December 1995, Vol. 11, No. 4, 279-284.

# Healthy Infants and Children - *Immunization*

## Success Indicator:

- Rate of immunization for two-year olds

## What are the trends?

The statewide immunization rate for children 19-35 months has improved by eleven percentage points from 64% in 1994 to 75.5% in 1999 for the complete series of shots. This improvement has resulted in the highest immunization rate in the history of the state.

## How does Missouri compare to others?

Using the Centers for Disease Control and Prevention's (CDC) National Immunization Survey (NIS), Missouri immunization rates can be compared to both national immunization levels and other states.

Missouri, since 1994, has improved the immunization rate for each vaccine. For example, in Missouri polio immunization was at 76% in 1994 and is moved to 83.5% in 1999.

However, there is still have work to do in the area of the fourth, diptheria, and for new vaccines introduced, such as varicella.

In 1999, Missouri's varicella rate was 51.4%. Border states had varicella rates ranging from 66.4% in Oklahoma and 53.5% in Kansas to 46.0% in Iowa and 43.6% in Illinois.

Year	DTaP	Polio	MMR
1994 National	77%	83%	89%
1994 Missouri	67%	76%	85%
1999 National	83.3%	89.6%	91.5%
1999 Missouri	81.5%	83.5%	88.1%

## Interventions that work:

### ***Multi-Component Intervention That Includes Education (Assessment and Feedback for Vaccination Providers, Provider Reminder/Recall, Client Reminder/Recall)***

A multi-component, evidence-based intervention that includes education (Assessment and Feedback for Vaccination Providers, Provider Reminder/Recall, Client Reminder/Recall) has been shown to be effective in increasing the demand for vaccination and enhancing access and quality of vaccination services.

Community-wide education should be aimed at improving the availability of information regarding vaccinations and increasing knowledge, acceptance and demand for vaccinations among clients, thereby changing behavior.

Provider assessment and feedback involves retrospectively evaluating the performance of providers in delivering one or more vaccinations to a client population and reporting this information back to the providers.

Reminders and recalls allow clients to know when vaccinations are due (reminders) or overdue (recall), as well as when to contact their vaccination provider to determine if vaccinations are needed. Provider reminder and recall systems make information regarding the client's immunization status available to providers manually or through a computerized system.

#### DHSS Strategies for Supporting the Interventions

1. Assist private providers in conducting clinic assessments to determine an immunization rate for their practice.
2. Promote reminder and recall activities for public providers and encourage private providers to implement reminder and recall activities.

#### References:

Public Health Service. *The Guide to Community Preventive Services*, Centers for Disease Control and Prevention. U.S. Government Printing Office, Washington, D.C. 2000.

*Recommendations Regarding Interventions to Improve Vaccination Coverage in Children, Adolescents, and Adults*. American Journal of Preventive Medicine, 2000; 18 (1S):92-96.

Epidemiology and Prevention of Vaccine-Preventable Disease, 6<sup>th</sup> Edition. Centers for Disease Control and Prevention. U.S. Government Printing Office, Washington, D.C. 2000.

*Assessing Immunization Performance of Private Practitioners in Maine: Impact of the Assessment, Feedback, Incentives, and Exchange Strategy*. Pediatrics 1999; 103(6):1218-1223.

*How to Increase Immunization Levels with Reminder/Recall Systems*. Vaccine Bulletin 1999; 11:4-5.

Centers for Disease Control and Prevention. *Prevention of Pneumococcal Disease: Recommendations of the Advisory Committee on Immunization Practices*. MMWR 1997; 46(RR-08):1-24.

Centers for Disease Control and Prevention. *Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices*. MMWR 2001; 40(RR-04):1-46.

Missouri Foundation for Health Report, Missouri Department of Health, July 2001.

# Healthy Infants and Children - *Overweight*

## Success Indicators:

- Percent of children who are overweight or at risk for overweight

## What are the trends?

The Missouri data for children who are overweight follows the same slight upward trend as the national data. The data shows an increase from 8.4% to 11.5% of the Missouri children in WIC from 1993 to 2000

**Children in WIC Aged 2 to < 5 Years  
Who are Overweight**

Year	Percentage
2000	11.5
1999	10.9
1998	9.8
1997	9.4
1996	9.0
1995	8.4
1994	8.3
1993	8.4

Source: CDC Pediatric Nutrition Surveillance System

The data shows an increase from 12.6% to 15.4% of the Missouri children in WIC from 1993 to 2000.

**Children in WIC Aged 2 to < 5 Years Who  
Are At-Risk for Overweight**

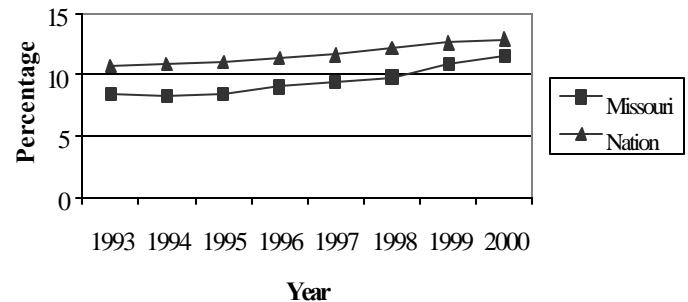
Year	Percentage
2000	15.4
1999	15.0
1998	14.5
1997	14.4
1996	13.9
1995	13.3
1994	13.2
1993	12.6

Source: CDC Pediatric Nutrition Surveillance System

## How does Missouri compare to others?

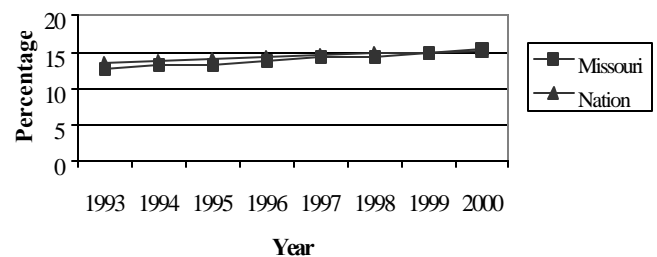
The Missouri data follows the same slight upward trend as the national data. The data shows an increase from 8.4% to 11.5% of the Missouri children in WIC from 1993 to 2000 versus an increase of 10.7% to 12.9% of all children in WIC, nationally from 1993 to 2000.

**Children in WIC Aged 2 to < 5 years  
who are Overweight  
Missouri and National Trends**



The Missouri and national data regarding percentage of children in WIC at-risk for overweight are very similar from the period of 1993 to 2000 (12.6% versus 13.6% for Missouri and nationwide, respectively for 1993 and 15.4% versus 15.1%, respectively, for 2000).

**Children in WIC Aged 2 to < 5 years who are  
At-Risk for Overweight  
Missouri and National Trends**



## Interventions that work:

### *Supplemental Nutrition Program for Women, Infants, and Children (WIC)*

The WIC Program provides nutritious foods to supplement the diets of pregnant women, new mothers, infants, and children up to five years of age based on eligibility. It provides food, nutrition counseling, and access to health services to low-income women, infants, and children.

The following benefits are provided to WIC participants:

- Health screening and risk assessment
- Nutrition education and counseling at WIC clinics
- Breastfeeding promotion and support
- Referrals to other services specific to individual needs, such as health care providers and social services agencies
- Issuing food instruments for supplemental nutritious food prescriptions

WIC is a Federally funded non-entitlement program. In 1999, WIC served 56.1 percent of all infants born in Missouri.

The WIC target populations are low-income and nutritionally at risk:

- Pregnant women (through pregnancy and up to 6 weeks after birth or after pregnancy ends). One in four new mothers participates in WIC.
- Breastfeeding women (up to infant's 1<sup>st</sup> birthday)
- Non-breastfeeding postpartum women (up to 6 months after the birth of an infant or after pregnancy ends)
- Infants (up to 1<sup>st</sup> birthday).
- Children up to their 5<sup>th</sup> birthday.

### DHSS Strategies for Supporting the Interventions

1. Develop, implement and evaluate a plan for early identification and referral to the WIC program of potentially eligible pregnant women.

## References:

U.S. Department of Health and Human Services. Healthy People 2010 (Conference Edition, in Two Volumes). Washington, D.C.: January 2000. Vol. II: 16-7, 16-26, 16-37.

U.S. Department of Health and Human Services. Healthy People 2010 (2nd ed.) Washington, D.C.: November 2000. Vol. II: 16-28.

Department of Health and Senior Services WIC Program Guidelines, [www.dhss.state.mo.us/wic/index.html](http://www.dhss.state.mo.us/wic/index.html).

Maternal, Infant, and Child Health Profile, Center for Health Information Management and Evaluation, Missouri Department of Health and Senior Services.



## Interventions that work:

### ***Community Policy and Environmental Change to Support Physical Activity and Good Nutrition***

Building strong social supports in community settings through the creation or enhancement of access to good nutrition and places for physical activity combined with informational outreach activities are necessary to support good nutrition and physical activity. Access to places for physical activity can be created or enhanced by building or enhancing existing trails, sidewalks, or facilities. Good nutrition and physical activity can also be incorporated into the structured areas of the community, such as childcare facilities and schools. Communities need to provide programs that allow infants and young children to be physically active and to ensure affordable, skilled childcare providers who promote physical activity for infants and young children. Safe and available environments—both indoor and outdoor—for physical activity are also a must for young children. The first step to ensuring that community policies and environments support physical activity is an assessment of that community's policies and environments.

The CDC coordinated school health program, which includes components for a healthy school environment; planned, sequential health education; physical education; nutrition services; health services; counseling, psychological, and social services; health promo-

tion for staff; and family and community involvement, should be implemented in elementary schools. In addition, the tool kit “Changing the Scene” developed by the United States Department of Agriculture (USDA) is an excellent resource for communities to use to improve the nutrition environment of schools. For more description of the Coordinated School Health Program and “Changing the Scene” see pages 27 and 33.

#### DHSS Strategies for Supporting the Interventions

1. Promote community assessments, planning, and coalition-building to increase the physical activity of young children and their families.
2. Disseminate the results of research and demonstration projects that utilize standardized education information on physical activity and good eating habits for parents and children.
3. Support community initiatives and evaluate programs that promote physical activity and healthy eating.
4. Recommend and support implementation and evaluation of the CDC School Health Index statewide.
5. Disseminate roles and responsibilities of agencies, school districts, and the community in the promotion of physical activity and healthy eating.
6. Provide technical assistance and funding to support implementation and evaluation of the “Changing the Scene” tool kit.

#### References:

- Patrick K, Spear B, Holt K, Sofka D, eds. 2001. *Bright Futures in Practice: Physical Activity*. Arlington, VA: National Center for Education in Maternal and Child Health.
- U.S. Department of Health and Human Services. The Surgeon General's call to action to prevent and decrease overweight and obesity. [Rockville, MD]: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General; 2001.
- Education Development Center. *Health is Academic: A guide to coordinated school health programs*. Marx E, Wooley SF (eds.). Teachers College Press: New York, 1998.
- Fryer E, Igoe JB, Beetem N. *Opening Doors to Improved Health for Missouri's School-age Children: An Evaluation Report*, 1998.
- Institute of Medicine. *Schools and health: Our nation's investment*. Washington, D.C.: National Academy Press, 1997
- Symons CW, Cinelli B, James TC, Groff P. *Bridging student health risks and academic achievement through comprehensive school health programs*. *Journal of School Health* 1997; 67:220-227.



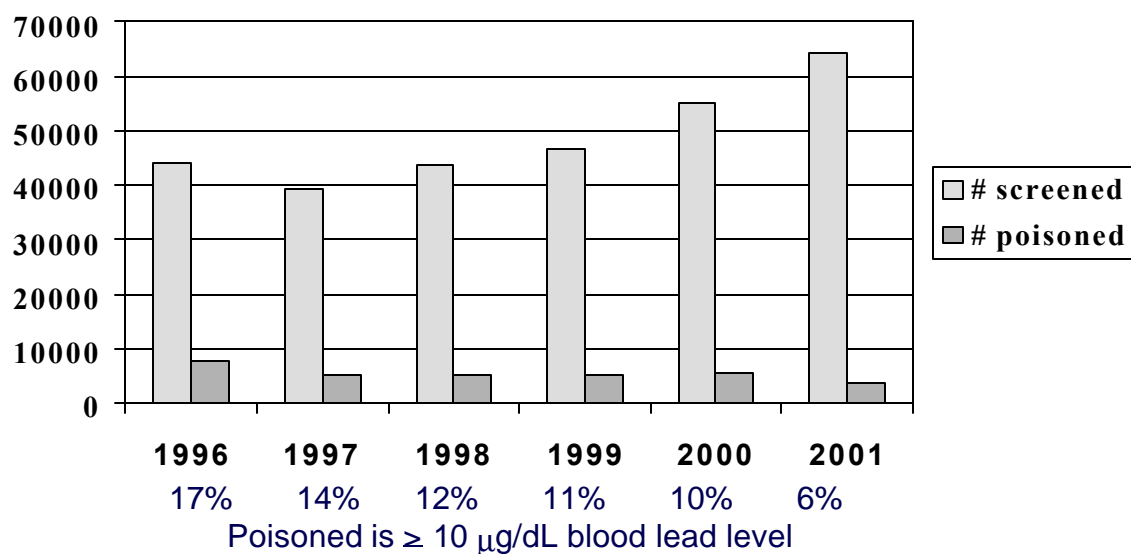
# Healthy Infants and Children - *Lead Poisoning*

## Success Indicators:

- Rate of lead poisoning (levels greater than 10 micrograms/deciliter) in children less than 72 months of age

**What are the trends?** Trends in Missouri (see below) mirror those noted nationwide.

**Missouri Children Screened for Lead Poisoning and Percent Of Those with Blood Lead Levels  $\geq 10$  mcg/dl**



Source: Missouri Department of Health and Senior Services blood lead testing data.

## How does Missouri compare to others?

1998 data from CDC MMWR weekly showed comparisons as follows:

State	% of children with BLL $\geq 10$ mg/dL
Missouri	12%
Alabama	9%
Connecticut	9%
Iowa	10%
Michigan	15%
Ohio	13%
Wisconsin	12%

### **Interventions that work:**

#### ***Case Management of Children with Elevated Blood Lead Levels***

Children identified with elevated blood lead levels should be evaluated and treated in accordance with CDC guidelines for follow-up care, including care coordination and public health, medical, and environmental management. Case management should include management of both medical condition and environment. For infants, lead exposure can come from the water supply to the home, from chewing on items containing lead (e.g., window blinds, or dust from window frames with lead-based paint).

Few children will have elevated blood lead levels high enough to warrant intensive medical treatment. However, many children with elevated blood lead levels will need follow up services, including more frequent blood testing, environmental investigation, case management and lead hazard control. The case manager assures that the family is educated about the importance of hygiene, nutrition, and ways to reduce lead hazards in their environment.

Medical care includes obtaining a detailed health history, assessment of signs and symptoms of lead exposure and toxicity and nutritional evaluation. In addition to the screening test, this information allows the health care provider to initiate appropriate care planning and referral. See page 72 for environment management.

#### **DHSS Strategies for Supporting the Interventions**

1. Implement and evaluate the statewide plan for childhood blood lead level screening that addresses both universal and targeted screenings.
2. Ensure environmental assessments are conducted to identify hazards that are affecting the health of the child and recommend ways to reduce or eliminate hazards.

#### **References:**

CDC. *Recommendations for blood lead screening of young children enrolled in Medicaid: targeting a group at high risk.* MMWR 2000; 49 (RR14); 1-13.

*Screening young children for lead poisoning: guidance for state and local public health officials.* Atlanta, GA: U.S. Department of Health and Human Services, Public Health Services, CDC, 1997.

*Preventing lead poisoning in young children: a statement by CDC—October 1991.* Atlanta, GA: U.S. Department of Health and Human Services, Public Health Services, CDC, 1991.

Missouri Department of Health. Lead Manual, July 2000.

# Healthy Infants and Children - *Asthma*

## Success Indicators:

- Rate of hospital emergency department visits for asthma for children aged 1-4

## What are the trends?

Among adults with children in the household 14.5% reported having at least one asthmatic child. Black and Hispanic adults reported a large percent of households with at least one child with asthma. Hispanic households at 28.3% were slightly higher than black households, 25.4%. This pattern is similar for households reporting two or more asthmatic children. However, the percent of Hispanic households with two or more asthmatic children (10.7%) was significantly higher than blacks (4.4%) or whites (1.5%).

Other than the above information on households with children with asthma, there is no prevalence data on asthma in children in Missouri. The estimated prevalence in childhood asthmas is reported by an adult respondent and does not necessarily reflect a clinical diagnosis. However, the Department of Health and Senior Services collects and reports data concerning asthma-related emergency room visits, hospitalization and preventable hospitalization.

The trends in asthma in Missouri were evaluated using Missouri Information for Community Assessment (MICA) data from the Department of Health and Senior Services (DHSS), Center for Health Information Management and Evaluation. The asthma data were analyzed for emergency room usage and hospitalization rates for the years 1993-2000. The results of the analysis are as follows:

- The asthma hospitalization rate has remained fairly constant over the eight years. However, the emergency room visit rate shows a steady increase for the treatment of acute asthma.

## Missouri Emergency Room Visits for Asthma, Children 1-4 years old

Year	Number	Rate
1993	4,530	15.0
1999	5,002	17.4
2000	4,807	16.2

Source: Missouri Department of Health and Senior Services, Missouri Information for Community Assessment (MICA)

### **Interventions that work:**

#### ***Coordinated Services for Asthma Prevention and Control***

All children and their families need access to continuous, comprehensive, coordinated, community-based care that is family centered, compassionate, and culturally competent. These elements of care are particularly critical to the optimal growth and development of children with special medical needs, especially those with special health care needs and asthma.

Every child should have a medical home. A medical home, as described by the American Academy of Pediatrics (AAP), has the following attributes: the provision of preventive care; the assurance of ambulatory and inpatient care, 24 hours a day; strategies and mechanisms to ensure continuity of care (from infancy through adolescence); identification of and medically appropriate use of subspecialty consultation and referrals; interaction with school and community agencies; and maintenance of a central record and database containing all pertinent medical information, including hospitalizations.

Specifically for asthma, comprehensive care should include:

- Physician educational programs to encourage the use of clinical practice guidelines.
- Community-oriented health promotion programs that target asthma-preventable risk factors (second hand smoking, reduction of home allergens), school health, church-based or community-based health promotion, including media campaigns to inform and increase awareness about asthma and preventability of complications.
- Self-management programs (management by a parent/care taker for children under age 5).
- A regional consortium to coordinate and implement these strategies. The consortiums involve patients and their family, health care providers, public health sector representatives and representatives of the community with potential impact on asthma prevention (e.g., industries, traffic authorities, urban development agencies, etc.).

#### **DHSS Strategy for Supporting the Interventions**

1. Use funding received from Centers for Disease Control and Prevention grant (2001-2004) to complete the statewide asthma plan and build capacity for implementation.

#### **References:**

Centers for Disease Control and Prevention. Asthma prevention program of the National Center for Environmental Health, 1999.

American Academy of Pediatrics. Policy Statement—Care Coordination: Integrating Health and Related Systems of Care for Children with Special Health Care Needs (RE9902), Pediatrics, October 1999, 104(4): 978-981.

Missouri Foundation for Health Report, Missouri Department of Health, July 2001.



# Healthy Adolescents

- Overview
- Success Indicators
- Interventions
  - Health Risk Behaviors
  - Motor Vehicle
  - Tobacco Use
  - Healthy Weight
  - Teen Pregnancy

# Healthy Adolescents - Overview

## Success Indicators:

- Rate of motor vehicle related injuries and deaths per 100,000 adolescents aged 15-24
- Percent of students grades 9 – 12 who smoked cigarettes on one or more of the past 30 days
- Percent of school-age adolescents that are healthy weight
- Rate of pregnancy per 1,000 adolescent females ages 15-17

## Why is adolescent health important?

**A**dolescence — the transition from childhood to adulthood—is one of the most dynamic stages of human development. It is a time of marked physical, emotional, and intellectual changes, as well as changes in social roles, relationships and expectations.

Adolescents are not just teenagers. The age range of adolescence includes 11-21 year-olds and includes three developmental stages: early adolescence (11-14 years of age), middle adolescence (15-17 years of age), and late adolescence (18-21 years of age). These developmental stages are important to consider when planning interventions and programs to meet health-related needs of adolescents.

- Adolescent health provides the foundation for adult health status. Life-long patterns of healthy behaviors are established at this time.
- Unhealthy adolescent behaviors can become long-term risk factors for chronic health conditions in adulthood.

Youth who have problems with schoolwork are more likely than others to be involved in multiple health and safety risks. Health and education are closely related; school failure needs to be viewed as a health and educational crisis.

When students are healthy, they are better learners and more likely to succeed in school.

## Why is adolescent health a critical issue in Missouri?

Adolescent health problems result in great personal, social, and monetary costs.

- **Motor vehicle crashes are the leading cause of injury and death for adolescents.**
  - ✓ Missouri adolescent deaths on roadways exceeded the national rate in the years 1995-1999.
- **Preventing adolescents from smoking saves lives and taxpayer dollars.**
  - ✓ If the current smoking rate continues, 139,484 of today's Missouri youth will die from tobacco-related illnesses.
  - ✓ Missouri's share of smoking-related Medicaid expenditures rose from \$80.7 million in 1993 to \$182.1 million in 2001.
  - ✓ The overall cost of tobacco use to Missourians is \$1.7 billion annually for direct health care and \$2.2 billion in lost productivity.
- **The prevalence of overweight children and adolescents has more than tripled in the past two decades.**
  - ✓ During that time, annual hospital costs for obesity-related conditions in youths aged 6-17 increased by \$92 million (in 2001 dollars).
  - ✓ A 1999-2000 assessment of 20,000 Missouri 5th and 9th graders found that nearly 40% were already overweight or at risk for being overweight.
- **Teen pregnancy has serious consequences for teen parents, their children and society.**
  - ✓ Teen childbearing costs taxpayers at least \$7 billion each year in direct costs associated with health care, foster care, criminal justice, and public assistance, as well as lost tax revenues.
  - ✓ Teen pregnancy is closely linked to a host of critical social issues including welfare dependency and overall child well-being, out-of-wedlock births, responsible fatherhood, and workforce development.

# Healthy Adolescents - Overview

There is no single solution to address the complexity of adolescent health needs and issues. The most promising strategies include prevention, intervention and health promotion efforts at places where young people's behavior can be influenced. Family and home, social relationships and school, neighborhood and community, all influence the health and well-being of youth.

Adolescents benefit from supportive environments and are less likely to engage in risk behaviors if they:

- ✓ have a sense of physical, emotional, and economic security
- ✓ have connections with caring adults and peers
- ✓ are able to make a contribution to the community and have input into decision-making
- ✓ believe that others have high expectations of them
- ✓ participate in engaging and challenging activities that build skills and competencies

## Four Targeted Action Areas

The Missouri Department of Health and Senior Services, in collaboration with other state agencies and community partners across the state, will focus on four targeted action areas to improve the health of Missouri's adolescents. The four areas include:

- 1) Motor vehicle safety
- 2) Tobacco use prevention
- 3) Healthy weight
- 4) Teen pregnancy prevention

Success Indicators	Healthy People 2010	2000 Baseline	2001 Target	2002 Target	2003 Target	2004 Target	2005 Target
Rate of deaths to adolescents aged 15-24 caused by motor vehicle crashes per 100,000	N/A	41.4	37.7	37.4	37.1	36.8	36.5
Rate of injury to adolescents aged 15-24 caused by motor vehicle-traffic per 100,000	N/A	3182.6	3123.2	3096.3	3069.4	3042.6	3015.7
Percent of students grades 9-12 who smoked cigarettes on one or more of the past 30 days	16.0%	32.8%	30.3%	30.3%	30.3%	30.3%	30.3%
Percent of adolescents ages 9-11 who are at a healthy weight	N/A	58.1%	58.4%	58.6%	59.0%	60%	60%
Percent of adolescents ages 12-17 who are at a healthy weight	N/A	58.7%	59%	60%	60%	60%	60%
Rate of pregnancy among adolescents aged 15-17 per 1,000	46.0	32.5	30.2	28.2	26.3	24.3	22.4

## References:

- Blum, R.W., Beuhring, T., Rinehart, P.M., (2000). *Protecting Teens: Beyond Race, Income and Family Structure*, Center for Adolescent Health, University of Minnesota, Minneapolis, MN.
- Centers for Disease Control and Prevention, (2002). *Economic Burden of Obesity in Youths Aged 6 to 17 years: 1979-1999*, *Pediatrics* [www.pediatrics.org/cgi/content/full/109/5/e81](http://www.pediatrics.org/cgi/content/full/109/5/e81).
- Clayton, S.L., Brindis, C.D., Hamor, J.A., Raiden-Wright, H., Fong, C., (2000). *Investing in Adolescent Health: A Social Imperative for California's Future*, University of California, San Francisco. National Adolescent Health Information Center.
- Green, M., Palfrey, J.S., Eds. (2000). *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*, Second Edition. Arlington, VA: National Center for Education in Maternal and Child Health.
- Rinehart, P.M., Kuhn, J., (2000). *Growing Absolutely Fantastic Youth: A Guide to Best Practices in Healthy Youth Development*, Konopka Institute for Best Practices in Adolescent Health, University of Minnesota, Minneapolis, MN.
- National Campaign to Prevent Teen Pregnancy, Washington, DC, (2002). *Not Just Another Single Issue: Teen Pregnancy Prevention's Link to Other Critical Social Issues*. Website: [www.teenpregnancy.org](http://www.teenpregnancy.org).
- Centers for Disease Control and Prevention, National Center for Injury Prevention & Control, *Motor Vehicle Crashes Among Teenagers*, <http://www.cdc.gov/ncipc/factsheets/teenmvh.htm>.



## **Interventions that work:**

### ***Coordinated School Health Program Middle Schools/High Schools***

**C**oordinated school health programs have been shown to effectively reduce the prevalence of health risk behaviors among young people. Coordinated school health programs have been especially proven effective in promoting the prevention of health behaviors for chronic diseases including physical activity, healthy eating, and tobacco use prevention. Coordinated school health programs can also address prevention of intentional injuries, abuse of alcohol and other drugs, and prevention of pregnancy, HIV and other sexually transmitted diseases. Coordinated school health programs can also improve students' access to needed health and mental health services.

A coordinated school health program addresses numerous adolescent health and developmental issues through a wide array of services. The eight components of the Centers for Disease Control and Prevention's (CDC) model coordinated school health program include:

1. Healthy School Environment
2. Health Education
3. Physical Education
4. Nutrition Services
5. Health Services
6. Counseling, Psychological, and Social Services
7. Health Promotion for Staff
8. Family/Community Involvement

## **Resources available to support coordinated school health programs:**

### **School Health Index**

The School Health Index is a self-assessment and planning guide developed by CDC to assist schools in assessing all eight of the components of the coordinated school health model. It is a self-assessment tool that a school can use to determine its own priorities for making improvements. Currently, the School Health Index addresses physical activity and healthy eating. Future versions will address all six behaviors that account for the most serious illnesses and premature deaths; future additions will include tobacco use, injury prevention, alcohol and other drugs, and sexual behavior. By using the School Health Index, schools voluntarily:

- Identify strengths and weaknesses of school health promotion policies and programs;
- Develop an action plan for improving the identified weaknesses and thus improving student health; and
- Involve teachers, parents, students, and the community in improving school health services and programs.

### **DHSS Strategies for Supporting the Intervention**

1. Provide technical assistance and funding to support components of the coordinated school health program.
2. Develop a White Paper that promotes roles and actions that key partners (School Boards, Administrators, Teachers, School Nurses, Food Service Personnel, Health Care Providers, Community Leaders, Parents, and Teens) can implement to promote physical activity and healthy eating among adolescents.
3. Recommend and support implementation and evaluation of the CDC School Health Index statewide.

## **References:**

Missouri Department of Health, *The Missouri Foundation for Health Report*, 2001.

Centers for Disease Control and Prevention (2000). *The School Health Index for Physical Activity and Healthy Eating: A Self-Assessment and Planning Guide* can be downloaded from <http://www.cdc.gov/nccdphp/dash>.



# Healthy Adolescents - *Motor Vehicle*

## Success Indicators:

- Rate of motor vehicle related deaths per 100,000 adolescents aged 15-24
- Rate of motor vehicle related injuries per 100,000 adolescents aged 15-24

## How does Missouri compare to others?

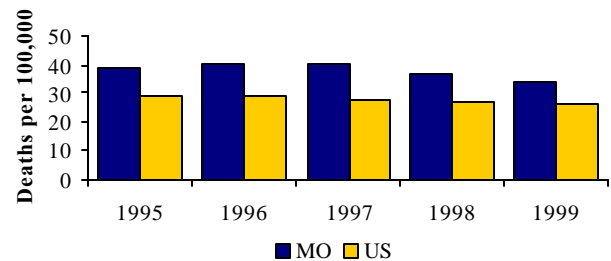
Missouri's rate for motor vehicle traffic related deaths exceeded the national rate each year of the same period. This is in spite of advances in roads and safety devices.

## What are the trends?

Adolescent deaths that are a result of motor vehicle crashes have declined slightly during the period between 1995 and 1999. The rate of death decreased from 39.3 per 100,000 adolescents in 1995 to 34.3 in 1999.

- Adolescents die on roadways in greater proportion than other drivers.
- Motor vehicle crashes are the leading cause of death for adolescents and young adults 15 to 24 years of age.
- 13.6% of adolescent drivers ages 16 through 20 involved in a crash were not wearing a seat belt compared to 9.3% for drivers of all ages involved in a crash.
- Approximately 28% of all drivers involved in a crash, not wearing seat belts, were ages 16 through 20.

**Motor Vehicle Traffic Related Deaths  
Adolescents and Young Adults Ages 15-24**



Source: *Vital Statistics*, Center for Health Information Management and Evaluation.

### Interventions that work:

#### *Interventions Designed to Increase the Use of Seat Belts*

**S**eat Belts – Much evidence exists to show the use of motor vehicle occupant seat belts decreases injuries and deaths in motor vehicle crashes.

Enhanced enforcement programs, including increased citations for non-compliance with seat belt laws, and media campaigns have been shown to increase safety belt use by 17% and reduce fatal injuries by 7% to 15%.

Primary enforcement of safety belt laws for all occupants of motor vehicles allows law enforcement officers to stop and ticket drivers for not wearing seat belts. Seat belt usage can be the primary reason to stop drivers. A combination of primary enforcement, media campaigns, and public education has been proven to be effective in increasing seat belt use and reducing deaths. States with primary seat belt laws have usage rates of 10 to 15 percentage points higher than states with secondary seat belt laws.

The habit of using seatbelts begins before children reach adolescence. Model child passenger safety programs include:

- National Highway Traffic Safety Administration (NHTSA) Standardized Child Passenger Safety Training Program. The NHTSA program is the first national training program to address the needs of child passenger safety (CPS) professionals. The program was developed to provide quality control in course content and instructors to ensure that information and materials used are up-to-date, accurate, and consistent. The program

ensures that CPS professionals, who are responsible for educating their communities on child passenger safety, have the most up-to-date training and information available. Certification is available through the American Automobile Association .

- “Mobilizing America to Buckle Up Children” is a basic training in child passenger safety enforcement for patrol officers. The program focuses on boosting overall enforcement of and compliance with child occupant protection laws, and increasing safety belt use among adults through routine traffic stops. Materials designed for Mobilizing America support many forms of training, from 10-15 minute self-instructional segments to a four hour instructor-led seminar.

#### DHSS Strategies for Supporting the Interventions

1. Strengthen enforcement of current seat belt law.
2. Encourage local and state policies/laws regarding seat belt usage.
3. Coordinate funding and programmatic efforts to promote seat belt usage.
4. Develop “toolkit” that includes core elements of a comprehensive approach for communities, including resources and funding opportunities.
5. Provide information, technical assistance and training to local communities to improve seat belt usage.

#### Reference:

The Missouri Foundation for Health Report, Missouri Department of Health, July 2001.

# Healthy Adolescents - Tobacco Use

## Success Indicators:

- Percent of Missouri students grades 9-12 who smoked a whole cigarette for the first time before age 13
- Percent of Missouri students grades 9-12 who smoked cigarettes on one or more of the past 30 days

## What are the trends?

Smoking among students grades 9-12 declined over the five year period 1995 –1999. The 2001 Missouri Youth Risk Behavior Survey shows an increase in smoking since 1999. Missouri's percent of high school students who smoke exceeded the national rate for the period from 1995 to 2001.

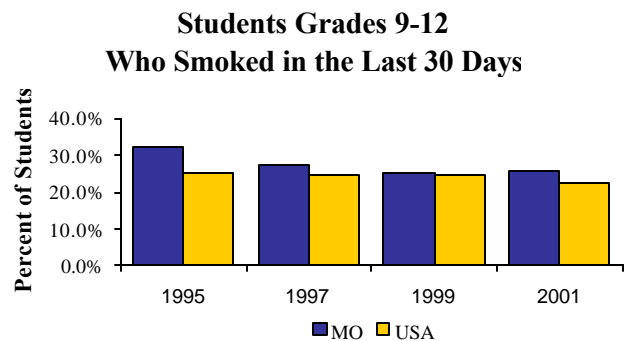
The percent of students who began smoking before age 13 followed a similar trend to the percent of students smoking. The percent of students who began smoking before age 13 also exceeded the national rate for the period from 1995-2001.

Preventing adolescents from smoking will save lives. Each year 10,300 Missourians die from tobacco-related illnesses. At the current rate of smoking among adolescents, 139,484 of today's youth in Missouri will die prematurely due to tobacco-related illnesses.

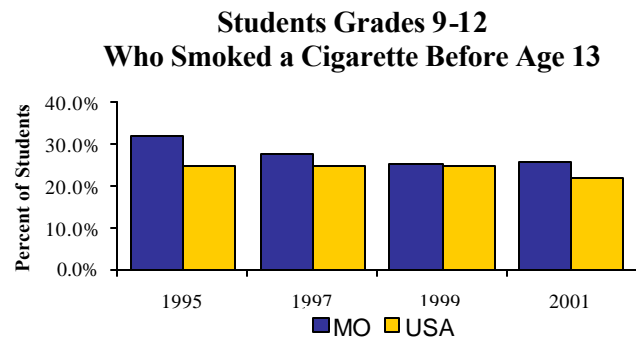
Tobacco use results in tremendous economic costs to Missouri. The state's share of Medicaid expenditures rose from \$80.7 million in 1993 to \$182.1 million in 2002 as a result of smoking.

The overall cost of tobacco use in Missouri is \$1.7 billion annually for direct health care and \$2.2 billion in lost productivity.

## How does Missouri compare to others?



Source: Youth Risk Behavior Survey—Missouri & United States



Source: Youth Risk Behavior Survey—Missouri & United States

## Interventions that work:

### *Comprehensive Tobacco Use Prevention Program*

Preventing adolescents from initiating and using tobacco products requires a comprehensive approach. The Centers for Disease Control and Prevention (CDC) recommends that states implement comprehensive tobacco use prevention and control programs.

CDC has identified key components for a comprehensive program based on evidence from states such as California and Massachusetts that have effectively reduced tobacco use.

- **Community programs** that encompass a range of policies and interventions including policies to reduce exposure to second hand smoke in public places.
- **Chronic disease programs** for screening and early detection of tobacco-related diseases.
- **School-based programs** integrated with community programs that include evidence-based prevention curricula and prohibition of smoking on campus by anyone.
- **Cessation programs** that incorporate counseling by medical providers and telephone counseling support. Health care coverage for cessation programs.
- **Media/counter-marketing** consisting of media advocacy and public relations to counter the tobacco industry influence with pro-health messages.
- **Statewide partnership programs** to eliminate disparity related to tobacco use.
- **Enforcement** of tobacco control policies to reinforce pro-health messages.
- **Surveillance and evaluation** to track trends in tobacco use and evaluate program effectiveness.

Schools that implemented the CDC “Guidelines for School Health Programs to Prevent Tobacco Use and Addiction” produced a reduction in smoking prevalence rates among eighth grade students.

#### References:

- Centers for Disease Control and Prevention (CDC) (1999). *Best Practices for Comprehensive Tobacco Control Programs*. [www.cdc.gov/nccdphp/osh/State Information](http://www.cdc.gov/nccdphp/osh/State Information).
- CDC. *Effectiveness of School-Based Programs as a Component of a Statewide Tobacco Control Initiative-Oregon, 1999-2000*. *MMWR* August 10, 2001;50(31):663-6.
- CDC (1996). *Programs that Work*. [www.cdc.gov/nccdphp/dash/Resouces](http://www.cdc.gov/nccdphp/dash/Resouces).
- Lantz, P., et al. (2001). *Youth Smoking Prevention: What Works*. *The Prevention Researcher* 8(2):1 -6.

The guidelines encourage the adoption and enforcement of school policies prohibiting tobacco use by students, staff, parents and visitors on the entire school campus and at school sponsored events. Implementation of evidence-based curricula such as *Project TNT* (Toward No Tobacco Use) and *Life Skills Training* for middle school students also contributes to a reduction of initiation and use by adolescents and is recommended by the CDC.

Communities play an important role in preventing adolescent tobacco use. Adoption and enforcement of effective policies banning smoking in public buildings and prohibiting sales of tobacco products to minors establishes a community norm that using tobacco is detrimental to the health of adolescents and adults. Adult role modeling is also a contributing factor in adolescent tobacco use.

Implementation of an evidence-based comprehensive approach to reduce adolescent tobacco use requires trained professionals who can give support to community agencies, coalitions, organizations, and schools in education and policy development. Communities and schools must work together to assess and enhance current tobacco use prevention policies and programs and plan how to educate the community regarding the need for evidence-based strategies to reduce tobacco use among adolescents.

#### DHSS Strategies for Supporting the Interventions

1. Engage in strategic planning with partners from other state agencies, organizations, universities, local public health agencies, schools, and coalitions to establish an evidence-based comprehensive tobacco use prevention program in Missouri.
2. Coordinate effective delivery of resources, technical support and training for local programs by collaborating with partners statewide.
3. Develop quality surveillance and evaluation systems to guide implementation and evaluation of and accountability for Missouri's comprehensive program.

# Healthy Adolescents - *Healthy Weight*

## Success Indicators:

- Percent of school-age adolescents who are healthy weight
  - Percent of adolescents who eat 5 or more servings of fruits and vegetables per day
  - Percent of students who exercised or participated in physical activities for at least 20 minutes that made them sweat and breathe hard on three or more of the past seven days

## What are the trends?

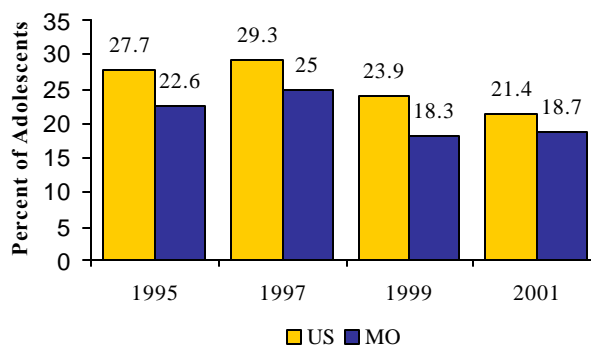
The prevalence of overweight children and adolescents has doubled since 1979. A 1999-2000 assessment of 20,000 Missouri fifth and ninth graders found that nearly 40% were already overweight or at risk for being overweight. Eighty percent of adolescents who are overweight go on to become obese adults.

Weight, exercise, and eating habits are not only related to physical health, but emotional and mental health as well. “Weight” is a very sensitive issue for some adolescents and their parents. Eating disorders (including anorexia, unhealthy weight loss and bulimia) are serious conditions that are being diagnosed in younger adolescents prior to high school. Eating disorders lead to medical and psychological problems that impair normal growth and development of teens. Another concern is the increased amount of “screen time” adolescents are spending watching television or surfing the Internet instead of engaging in physical activity.

Maintaining healthy weight is best accomplished through healthy eating behaviors and regular physical activity. Physical activity and nutrition can affect adolescents’ energy levels and influence growth and body composition. Physical activity can reduce anxiety and stress and increase self-esteem. Nutritious eating habits can positively impact problem-solving skills and academic achievement.

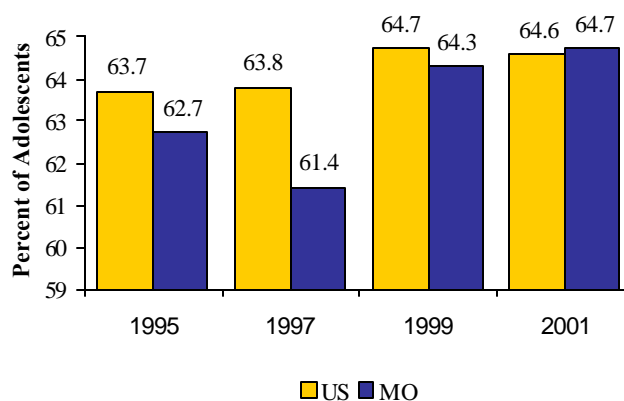
## How does Missouri compare to others?

**Adolescents Grades 9-12 Who Ate 5 or More Servings per Day of Fruits and Vegetables**



Source: Youth Risk Behavior Survey—Missouri & United States

**Adolescents Grades 9-12 Who Participated in Vigorous Activities**



Source: Youth Risk Behavior Survey—Missouri & United States

## Interventions that work:

### ***Community Initiatives that Promote and Support Physical Activity and Nutrition Environments***

The research strongly recommends social support interventions in community settings and the creation of (or enhanced access to) places for physical activity combined with informational outreach activities. Effective behavioral change interventions focus on activity behavior through building and maintaining supportive social networks. Access to places for physical activity can be created or enhanced by building or enhancing existing trails, sidewalks, or facilities.

One model initiative is Hearts N' Parks, a national, community-based program supported by a partnership between the National Heart, Lung, and Blood Institute (NHLBI) and the National Recreation and Park Association (NRPA). This innovative program aims to reduce the growing trend of obesity and risk of coronary heart disease by encouraging Americans of all ages to aim for healthy weight, follow a heart-healthy eating plan, and engage in regular physical activity. Hearts N' Parks activities can be incorporated into a variety of programs through recreation and park departments and other community organizations. Staff training and resources are provided to integrate heart-healthy activities into existing or new programs. Evaluation materials to measure the program's impact are also included. Missouri was designated by NHLBI

and NRPA as one of ten states to serve as Magnet Centers for the expanded implementation of the Hearts N' Parks Program. Six parks and recreation departments in Missouri have agreed to participate; they include Des Peres, Jefferson City, Kansas City, Poplar Bluff, Rolla, and Springfield.

#### **“Changing the Scene” Tool Kit**

The United States Department of Agriculture (USDA) has developed a “Changing the Scene” tool kit to help communities improve the nutrition environment of schools. This tool was developed in collaboration with more than 20 national organizations, including the American Academy of Pediatrics, The American Dietetic Association, the United States Department of Education, and the CDC.

“Changing the Scene” includes definitions of success for six components:

- A Commitment to Nutrition and Physical Activity
- Quality School Meals
- Other Healthy Options
- Pleasant Eating Experiences
- Nutrition Education
- Marketing

#### DHSS Strategy for Supporting the Intervention

1. Support expanded implementation of community initiatives and programs that promote physical activity and healthy eating.

## References:

National Institutes of Health, National Heart, Lung, and Blood Institute, and National Recreation and Park Association. (2000). *Hearts and Parks Community Mobilization Guide*. NHLBI Health Information Center, Bethesda, MD. [http://www.nhlbi.nih.gov/health/prof/heart/obesity/hrt\\_n\\_pk/hnp\\_ab.htm](http://www.nhlbi.nih.gov/health/prof/heart/obesity/hrt_n_pk/hnp_ab.htm).

U.S. Department of Agriculture, Team Nutrition, Food and Nutrition Service, *Changing the Scene: Improving the School Nutrition Environment*. Alexandria, VA. [www.fns.usda.gov/tn](http://www.fns.usda.gov/tn).



# Healthy Adolescents - Teen Pregnancy

## Success Indicator:

- Rate of pregnancy among adolescents aged 15-17 per 1,000 population

## What are the trends?

Missouri's pregnancy rate for adolescents ages 15-17 has steadily declined since 1995. The rate for 2000, 32.5, represents approximately a 25% decline from the 1995 rate of 42.0.

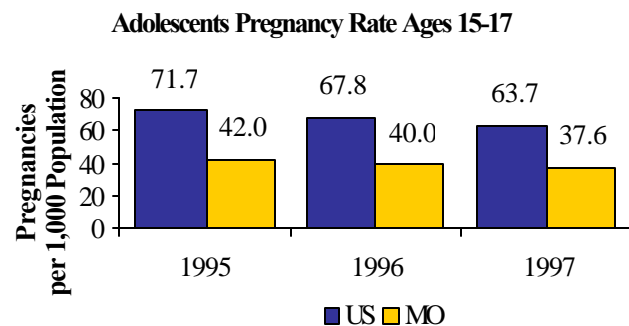
Teen pregnancy is closely linked to a host of other critical social issues—welfare dependency and overall child well being, out-of-wedlock births, responsible fatherhood, and workforce development. Youth at greatest risk are more likely to live in areas with high poverty, low levels of education, high residential turnover, and high divorce rates. Other risk factors include school failure, drug and alcohol use, early sexual activity, low parental expectations for academics, and low connectedness with parents, other adults and school. Teen girls whose first partners are older teens or adult men are at increased risk for becoming pregnant.

Not only does teen childbearing have serious consequences for teen parents, their children, and society, it also has important economic consequences.

- Teen childbearing costs taxpayers at least \$7 billion each year in direct costs associated with health care, foster care, criminal justice, and public assistance, as well as lost tax revenues.
- A cost-benefit analysis suggests that the government could spend up to eight times more than is currently being spent on teen pregnancy prevention and still break even.
- A study estimating the cost-effectiveness and cost-benefit of one particular curriculum found that for every dollar invested in the program, \$2.65 in total medical and social costs were saved. The savings were produced by preventing pregnancy and sexually transmitted diseases (STDs).

While the teen pregnancy rates are at their lowest level in 20 years, the United States still has the highest rates of teen pregnancy among any other country in the industrialized world. In Missouri, the teen pregnancy rate for 15-17 year olds has declined from 42 per 1,000 in 1995 to 32.5 per 1,000 in 2000—but still more than 4,000 Missouri teenagers become pregnant each year. Missouri cannot be complacent about the need to invest in programs that support healthy adolescent development and help prevent teen pregnancy.

## How does Missouri compare to others?



Source: *Vital Statistics*, Center for Health Information Management and Evaluation.

## Interventions that work:

### *Programs That Promote Healthy Youth Development and Reduce Teen Pregnancy*

Research strongly suggests that youth development programs that include service learning, promote healthy behavior, life skills development, and a sense of purpose can reduce teen pregnancy.

“Although the research does not clearly indicate why service learning is so successful, several possibilities seem plausible: participants develop relationships with program facilitators, they gain a sense of autonomy and feel more competent in their relationships with peers and adults, and they feel empowered by the knowledge that they can make a difference in the lives of others. All such factors, in turn, may help increase teenagers’ motivation to avoid pregnancy. In addition, participating in supervised activities—especially after school—may simply reduce the opportunities teens have to engage in risky behavior, including unprotected sex.”

One of more promising programs is the *Teen Outreach Program*.

The *Teen Outreach Program (TOP)* is a model youth development approach proven effective in increasing academic success, and preventing teen pregnancy and negative behavior among program participants. In an experimental evaluation of the program, high school students from 25 sites nationwide were randomly assigned to a *TOP* group or a control group. The program produced these outcomes:

- 11% lower rate of course failure;
- 14% lower rate of suspension;
- 33% lower rate of pregnancy; and
- 60% lower school dropout rate.

Results suggested the potential value of the *TOP* specifically, and also more generally of interventions that seek to prevent problem behaviors by addressing broad developmental tasks of adolescence rather than by focusing upon the individual problem behaviors.

*TOP* is a nationally replicated program that gives communities a framework for cultivating a variety of strategies for local implementation. The *TOP* can be successfully implemented by schools, as well as by community and faith-based organizations that serve youth. The program is ideally suited to reach young people between the ages of 12-17.

The program has two main features: 1) curriculum-guided group discussions and 2) opportunities for young people to provide volunteer services designed to improve their communities. *TOP* sessions include a wide range of topics of interest to adolescents including friendships, relationships, sexuality education, and other issues. Each program is independently operated and focuses on the specific problems facing the particular community in which it is implemented.

Currently there are several *Teen Outreach Programs* successfully being implemented in Missouri.

### DHSS Strategies for Supporting the Interventions

1. Establish and lead an interagency task force to identify and coordinate resources across agencies and organizations that promote healthy adolescent development and reduce teen pregnancy.
2. Provide information and technical assistance to enable counties and communities with higher than state teen pregnancy rates to implement youth development programs shown to reduce teen pregnancy.
3. Develop a plan to compare and evaluate promising programs designed to reduce teen pregnancy.

## References:

- Kirby, D., The National Campaign to Prevent Teen Pregnancy, (2001). *Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy*.
- Manlove, J., et al. (2002). *Preventing Teen Pregnancy, and Sexually Transmitted Diseases: What the Research Shows*. *Child Trends Research Brief*. Washington, DC, [www.childtrends.org](http://www.childtrends.org).





# Healthy Adults

- Overview
- Success Indicators
- Interventions
  - Tobacco Use
  - Physical Activity
  - Nutrition
  - Sexually Transmitted Diseases
  - Tuberculosis

# Healthy Adults - Overview

## Success Indicators:

- Prevalence of current smoking
- Prevalence of overweight and obesity
- Prevalence of physical inactivity
- Prevalence of individuals consuming 5 or more fruits and vegetables daily
- Rate of sexually transmitted diseases
- Rate of tuberculosis

## Why is the health of adults important?

Poor health is not an inevitable consequence of aging. Although the risk of disease and disability increases with advancing age, much of the illness, disability, and death associated with chronic disease is avoidable through known prevention measures. Key measures include practicing a healthy lifestyle and the use of early detection practices which include:

- regular physical activity
- healthy eating
- avoiding tobacco use
- responsible sexual behavior
- screening for breast, cervical, skin, and colorectal cancers, cardiovascular disease, diabetes and its complications, and depression

## Why is the health of adults a critical issue for Missouri?

### • Smoking

- ✓ Each day in Missouri, smoking causes more than 28 deaths.
- ✓ In 2001, over one-fourth (25.9%) of Missouri adults smoked. Missouri's high smoking rates contribute to the state's ranking well above the U.S. average for such smoking-related health problems as heart disease, cancers, emphysema, and low-birth-weight infants.
- ✓ Health care expenditures that are attributed to tobacco use in Missouri account for over \$1.7 billion annually. Approximately \$415 million of this amount is in Medicaid costs.

### • Overweight and Obesity

- ✓ Obesity is considered to be at epidemic proportions in Missouri.
- ✓ In 2000, Missouri ranked 10th in the prevalence of obesity in the United States.

### • Physical Inactivity

- ✓ In 2000, the prevalence of physical inactivity in Missouri adults is 16th highest in the nation.

### • Nutrition

- ✓ In 2000, only 20.7% of Missouri adults reported eating 5 or more servings of fruits and vegetables per day.
- ✓ Racial disparities regarding fruit and vegetable consumption are greater in Missouri than nationally. Nationally, 21.3% of African-American adults reported daily consumption of 5 fruits and vegetables while that number was only 14.9% for Missouri African-American adults.

### • Sexually Transmitted Diseases

- ✓ In 2000, Missouri ranked 14th in the incidence rate of gonorrhea, 32nd in the rate of syphilis, and 24th in the rate of chlamydia in the nation.
- ✓ Direct costs alone (inpatient and outpatient) equate to over \$200 million for STDs within Missouri.

### • Tuberculosis

- ✓ Treatable, but not vaccine preventable, tuberculosis is one of the major diseases that have developed antibiotic drug resistant strains.

## Healthy Adults - Overview

Success Indicators	Healthy People 2010	2000 Baseline	2001 ***	2002 Target	2003 Target	2004 Target	2005 Target
Percent of adult current smokers	12.0	27.2	25.9	25.8	25.7	25.6	25.4
Prevalence of overweight (BMI 25-29.9 kg/m <sup>2</sup> )	**	34.4	36.2	33.7	33.4	33.1	32.7
Prevalence of obesity (BMI ≥ 30 kg/m <sup>2</sup> )	15.0	22.1	23.2	21.7	21.5	21.3	21.0
Percent of adults who report no leisure time physical activity during past month	20.0	28.8	27.5	26.1	24.8	23.6	22.4
Prevalence of individuals consuming 5 or more fruits and vegetables daily	**	20.7	*	21.7	*	22.8	*
Rate of sexually transmitted diseases:							
Syphilis	0 (elimination)	0.5	0.5 (actual)	1.5	1.4	1.3	1.2
Gonorrhea	119.0	162.4	159.5 (actual)	132.7	120.8	110.0	100.0
Chlamydia	**	245.9	255.1 (actual)	224.4	215.9	207.7	200.0
Rate of tuberculosis	0 (elimination)	3.8	2.8	2.8	2.4	2.0	1.8

\*Data not available

\*\*No comparable 2010 objective or uses different data source

\*\*\*Preliminary data

### References:

2000 Missouri Behavioral Risk Factor Surveillance System (BRFSS). Missouri Department of Health, Division of Chronic Disease Prevention and Health Promotion.

Simoes EF, Holt B, Miller N. *Chronic Disease Report*. Columbia MO: Missouri Department of Health, Division of Chronic Disease Prevention and Health Promotion, 2000.

## Success Indicators:

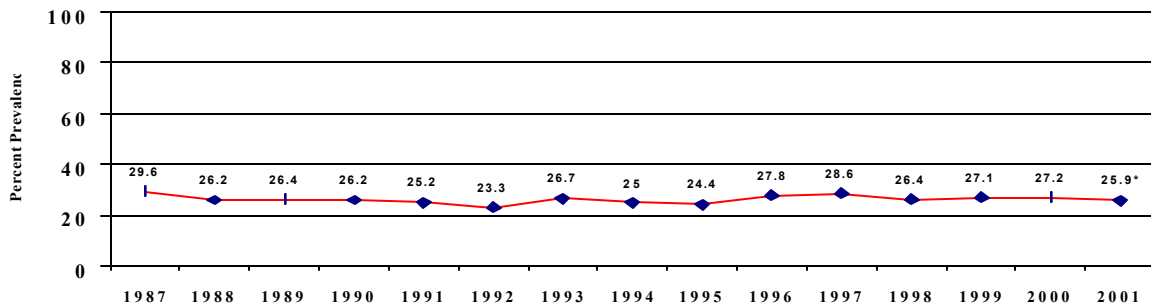
- Prevalence of current smoking

## What are the trends?

The trend in the prevalence of tobacco use among adults has remained stable over the past decade. Among adults the prevalence rate was 26.2% in 1988, and the preliminary rate in 2001 was 25.9%.

In 2000, adults aged 18-24, followed by those aged 35-44, had higher smoking rates (35.9% and 33.1%, respectively), compared to other age groups.

**Prevalence of Current Smoking  
Missouri Adults, 1987 - 2001**

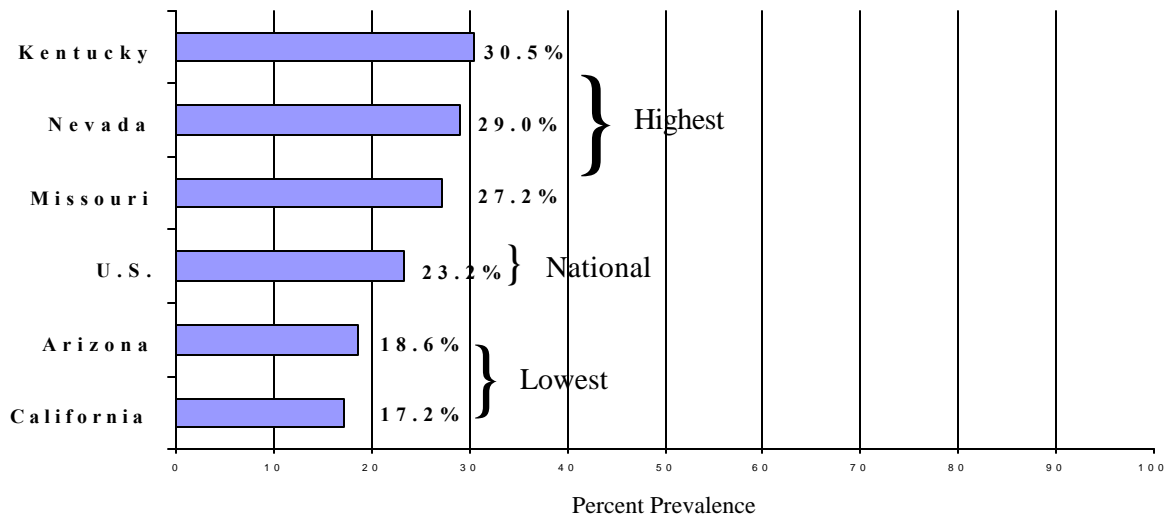


Source: Centers for Disease Control and Prevention (CDC, 1987-2001). Behavioral Risk Factor Surveillance System (BRFSS).  
All respondents 18 or older who have ever smoked 100 cigarettes in their lifetime and reported currently smoking every day or some days.  
% = weighted percentage, except for 1987-1989, which are raw data, DHSS internal analysis.  
\*2001 preliminary prevalence

## How Does Missouri Compare to Others?

Based on 2000 data, among adults, Missouri ranked third highest in smoking prevalence in the nation.

**Prevalence of Current Smoking Among States  
Comparing Missouri to the National Prevalence and States with the  
Highest and Lowest Rankings, 2000**



Source: Behavioral Risk Factor Surveillance System—2000.  
CDC.

## Interventions that work:

### *Comprehensive Tobacco Use Prevention Program*

**C**omprehensive statewide tobacco use prevention program key components include:

- **Community programs** that encompass a range of policies and interventions including policies to reduce exposure to second hand smoke in public places.
- **Chronic disease programs** for screening and early detection of tobacco-related diseases.
- **School-based programs** integrated with community programs that include evidence-based prevention curricula and prohibition of smoking on campus by anyone.
- **Cessation programs** that incorporate counseling by medical providers and telephone counseling support. Health care coverage for cessation programs.
- **Media/counter-marketing** consisting of media advocacy and public relations to counter the tobacco industry's influence with pro-health messages.
- **Statewide partnership programs** to eliminate disparity related to tobacco use.
- **Enforcement** of tobacco-control policies to reinforce pro-health messages.
- **Surveillance and evaluation** to track trends in tobacco use and evaluate program effectiveness.

Evidence from other states clearly indicates the effectiveness of comprehensive statewide tobacco use prevention programs. For example, California:

- cut tobacco consumption by 50%, resulting in one million fewer smokers since 1990; 21% of the overall reduction in tobacco consumption is credited to the anti-smoking media campaign
- cut lung and bronchial cancer rates by 14%
- prevented more than 33,000 deaths from heart disease
- saved \$390 million in the first seven years by reducing heart attacks and strokes caused by smoking
- saved \$100 million by reducing the number of pregnant women who smoke

Oregon:

- decreased adult smoking by 21%
- decreased smoking among pregnant women by 14%

Massachusetts:

- reduced total tobacco consumption by 32% — four times the rate of the rest of the country
- reduced direct health care costs by \$85 million annually, more than twice what the state spends on its tobacco prevention programs

Arizona:

- cut per capita cigarette consumption by 8.4% as a result of an increase in excise tax
- reduced smoking rate by 21%
- stimulated the first local 100% smoke-free restaurant ordinances in the state's history

Raising the price of tobacco is one of the most effective ways to reduce smoking-related deaths and their social and economic costs. When the price of a pack of cigarettes increases 10%, overall consumption will decrease by three to five percent, the smoking rate falls about seven percent for teens and pregnant women and about six percent for 18-24 year olds.

### DHSS Strategies for Supporting the Intervention

1. Engage in strategic planning with partners from other agencies, organizations, universities, local public health agencies, schools and coalitions to establish and fund an evidence-based comprehensive tobacco use prevention program in Missouri.
2. Coordinate effective delivery of resources, technical support and training for local programs by collaborating with partners statewide.
3. Develop quality surveillance and evaluation systems to guide implementation of and accountability for Missouri's comprehensive program.
4. Support efforts to increase the excise tax on tobacco products.
5. Promote efforts to protect Missourians against the effects of secondhand smoke.

### Reference:

*Best Practices for Comprehensive Tobacco Control Programs* framework issued in 1999, CDC.

## Success Indicators:

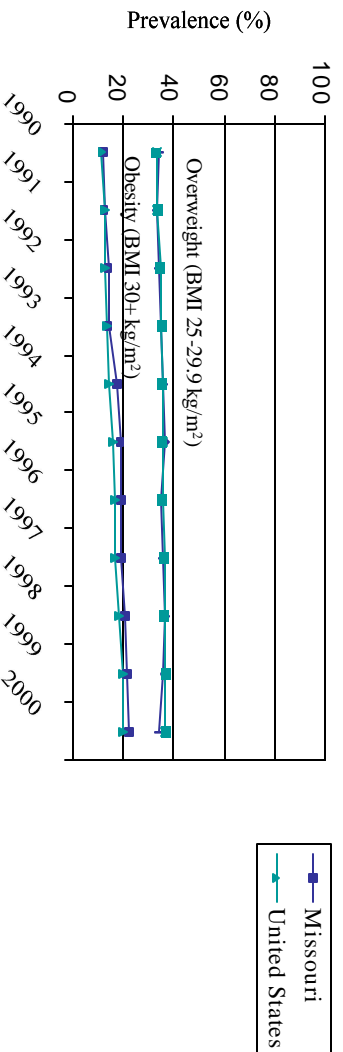
- Prevalence of overweight and obesity

## What are the trends?

Obesity is considered to be at epidemic proportions in the United States, and Missouri is no exception. Obesity rates increased by 66% from 1990 to 2000.

The prevalence continues to rise with Missouri's most recent prevalence rate slightly higher than the national estimates. Overweight trends are stable for the U.S. and Missouri from 1990 to 2000.

**Overweight and Obesity Trends, 1990-2000**  
Missouri vs. United States



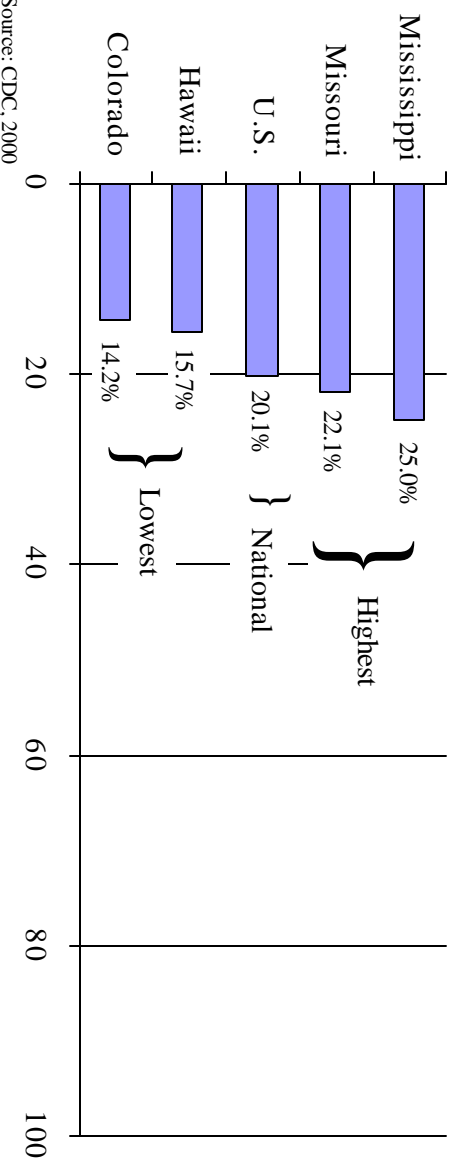
Source: BRFSS, 1990-2000

## How does Missouri compare to others?

In 2000, Missouri ranked tenth in the prevalence of obesity in the United States and that prevalence continues to increase. The Missouri obesity prevalence is slightly higher than that of the United States.

Nationally, as in Missouri, obesity disproportionately affects minorities -- the prevalence is 30.2% of non-Hispanic African American women and 28.4% of Mexican-American women.

**Prevalence of Obesity Among States,  
Comparing Missouri to the National Prevalence and States with  
The Highest and Lowest Prevalence**



Source: CDC, 2000

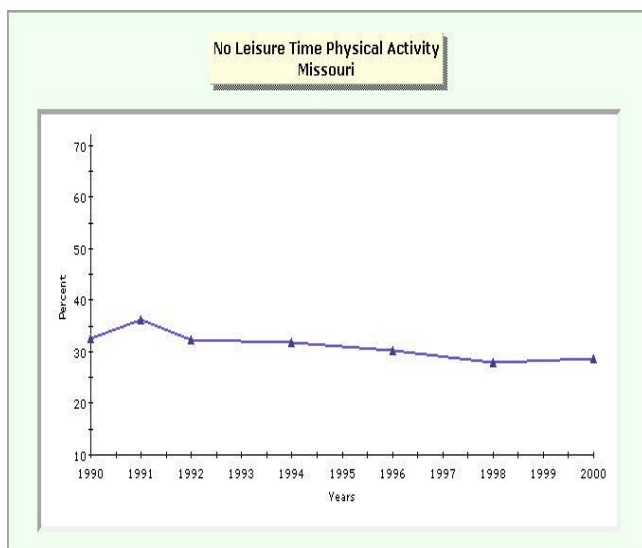
# Healthy Adults - *Physical Activity*

## Success Indicators:

- Prevalence of physical inactivity

## What are the trends?

The prevalence of physical inactivity in Missouri adults has decreased slightly over the last decade, from a peak prevalence of 36.3% in 1991 to a decade low prevalence of 27.9% in 1998.



Data collected every even numbered year; no Missouri data for 1993, 1995, 1997, and 1999.

Data are weighted to each year's U.S. and state population estimates and age-adjusted to the year 2000 U.S. population standard.

Source: CDC, BRFSS using all participating states' data each year.

## How does Missouri compare to others?

The prevalence of physical inactivity in Missouri adults (28.8%), which is 16<sup>th</sup> highest in the nation, does not differ significantly from that of the U.S. overall median (26.9%).

## Prevalence of Physical Inactivity by State and Gender, 2000

State	Overall	Men	Women
U.S. Median	26.9	24.0	28.6
Missouri	28.8	28.4	29.2
Iowa	27.3	26.8	27.7
Kansas	30.4	28.5	32.2
Washington	16.9	15.8	17.9
Kentucky	41.1	40.0	42.1

Source: CDC, BRFSS (2002), <http://www.cdc.gov/brfss/>

## References:

Lee IM, Hsieh CC, Paffenbarger RS Jr., *Exercise Intensity and Longevity in Men: The Harvard Alumni Health Study*. JAMA 1995;273:1179-84.

Paffenbarger RS Jr, Hyde RT, Wing AL, Lee IM, Jung DL, Kampert JB. *Association of Changes in Physical-Activity Level and other Lifestyle Characteristics With Mortality Among Men*. N Engl J Med 1993;328:538-45.

Paffenbarger RS Jr, Kampert JB, Lee IM, Hyde RT, Leung RW, Wing AL. *Changes in Physical Activity and other Lifeway Patterns Influencing Longevity*. Med Sci Sports Exerc 1994;26:857-65.

Blair SN, Kohl HW 3<sup>rd</sup>, Barlow CE, Paffenbarger RS Jr, Gibbons LW, Macera CA. *Changes in Physical Fitness and All-Cause Mortality: A Prospective Study of Healthy and Unhealthy Men*. JAMA 1995;273:1093-8.

CDC. *Increasing Physical Activity: A Report on Recommendations of the Task Force on Community Preventive Services*. MMWR 2001; 50 (No. RR-18): 1-16.

### **Interventions that work:**

#### ***Community-Based Interventions to Increase Physical Activity***

**R**egular physical activity substantially reduces the risk of dying of coronary heart disease, the nation's leading cause of death, and decreases the risk for colon cancer, diabetes, and high blood pressure. It also helps to control weight; contributes to healthy bones, muscles, and joints; reduces risk for falls among the elderly; helps to relieve the pain of arthritis; reduces symptoms of anxiety and depression; and is associated with fewer hospitalizations, physician visits, and medications.

Despite the proven benefits of physical activity, over 75% of Missouri adults do not get enough physical activity to provide health benefits.

By implementing interventions demonstrated to be effective in increasing physical activity, policy makers and public health providers can help their communities become healthier while using community resources efficiently. The Task Force on Community Preventive Services strongly recommends the following intervention to improve physical activity.

- Community-wide campaigns—large-scale, highly visible campaigns with messages directed to large audiences through different types of media, including television, radio, newspapers, movie theaters, billboards, and mailings.
- School-based physical education (PE) - increase the amount of time students spend doing moderate or vigorous activity in PE class or having students be more active during class.

- Social support interventions in community settings—changing physical activity behavior through building, strengthening, and maintaining social networks that provide supportive relationships for behavior change (e.g., setting up a buddy system or setting up walking groups or other groups to provide friendship and support).
- Individually-adapted health behavior change programs—behavior change programs teach behavioral skills to help participants incorporate physical activity into their daily routines.
- Creation of, or enhanced access to, places for physical activity combined with informational outreach activities—efforts of worksites, coalitions, agencies, and communities in attempts to change the local environment to create opportunities for physical activity. Such changes include creating walking trails, building exercise facilities, or providing access to existing nearby facilities.

#### **DHSS Strategies for Supporting the Intervention**

1. Partner with communities and other state and federal agencies to conduct a policy and environmental inventory, assess the current status of physical activity, and develop a statewide report with recommendations.
2. Establish baselines for levels of physical activity for adults and elementary and middle school-aged children by linking surveillance systems.
3. Increase the number of communities each year that adopt policy and environmental changes that promote physical activity.

#### **References:**

The Task Force on Community Preventive Services. (2002). *Promoting Physical Activity*. [http://www.thecommunityguide.org/GUIDE/PhA/Physical%20Activity\\_1Pager.html](http://www.thecommunityguide.org/GUIDE/PhA/Physical%20Activity_1Pager.html).

Healthy People 2010: <http://www.health.gov/healthypeople>.

Bouchard C, Shephard RJ, Stevens T, eds. *Physical activity, Fitness, and Health: International Proceedings and Consensus Statement*. In: Proceedings of the 1992 International Conference on Physical Activity, Fitness, and Health. Champaign, IL: Human Kinetics Publisher, 1994.

CDC. Physical activity trends-United States, 1990-1998. *MMWR* 2001; 50: 166-9.

US Department of Health and Human Services. Healthy People 2010 (conference ed in 2 vols) Washington, DC: US Department of Health and Human Services, 2000.



# Healthy Adults - *Nutrition*

## Success Indicators:

- Prevalence of individuals consuming 5 or more fruits and vegetables daily

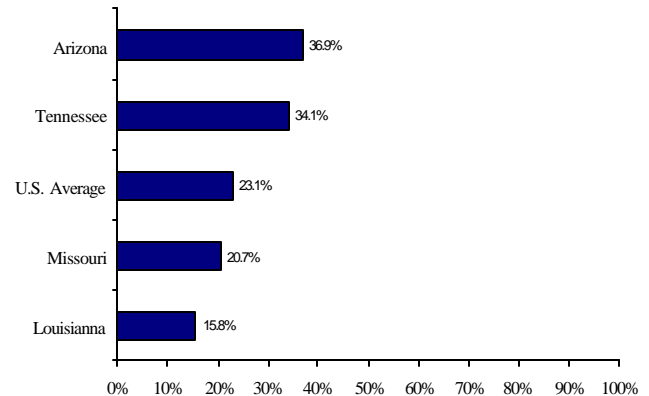
## What are the trends?

In 2000, only 20.7% of Missouri adults reported eating 5 or more servings of fruits and vegetables each day. Missouri women reported better fruit and vegetable consumption than Missouri men, with 24.2% of women and 16.8% of men consuming the recommended number of servings. From 1990 to 2000, the proportion of Missouri adults who ate five or more servings of fruit and vegetables remained basically unchanged.

## How Does Missouri Compare to Others?

Nationally, the proportion of U.S. adults who eat 5 or more daily servings of fruits and vegetables was 23.1%. In all states, adults reported low levels of daily fruit and vegetable consumption. Arizona reported the highest level (36.9%), while Louisiana reported the lowest (15.8%). Missouri (20.7%) ranked below the national average.

## Percent State Populations Consuming 5+ Servings of Fruits and Vegetables Per Day



Source: Behavior Risk Factor Surveillance System 2000 Centers for Disease Control and Prevention

Racial disparities regarding fruit and vegetable consumption are greater in Missouri than nationally. Nationally, 21.3% of African-American adults reported daily consumption of 5 fruits and vegetables, similar to the level of consumption for white adults (23.4%). However, in Missouri only 14.9% of African-American adults reported daily consumption of 5 fruits and vegetables, substantially lower than the level of consumption for white adults (21.4%). Twenty-two percent of Missouri Hispanic adults reported eating the recommended amount.

### Interventions that work:

#### *Integrated Nutrition and Health Promotion Programs*

**N**utrition programs in all chronic disease prevention and health promotion programs sponsored by the Centers for Disease Control and Prevention (CDC) are to be integrated with strategies to increase physical activity. Eliminating disparities by providing accessible and affordable opportunities to eat healthfully and be active is a goal for all programs.

Although there is limited evaluation data on effectiveness in changing long-term eating behaviors, interventions that seem to be working indicate that success requires not only strategies to change individual behaviors but also strategies to change community environments. Environmental influences from workplaces, grocery stores, restaurants, communities and mass media often compete with personal goals to improve eating habits. Long-term improvement in nutritional habits requires the ready availability of appealing, affordable fruits and vegetables.

#### **5 A Day for Better Health**

The National Cancer Institute (NCI) and the Produce for Better Health Foundation are lead agencies in the national 5 A Day program that works to increase the intake of fruits and vegetables through educational materials, public service announcements and web and computer technology. Through partnerships with the CDC and the United States Department of Agriculture (USDA), the 5 A Day program works to increase awareness of the importance of fruit and vegetable consumption through all federal nutrition programs.

#### **Missouri Nutrition Network**

This program develops, implements, and evaluates nutrition education initiatives and materials designed to provide effective nutrition information to food stamp eligible families and their children. The Dietary Guidelines for Americans are the foundation for nutrition education with increasing intake of fruits and vegetables as one of the core nutrition messages.

#### **Farmers' Market Nutrition Program**

The Farmers' Market Nutrition Program provides fresh fruits and vegetables from farmers' markets to Women, Infants and Children (WIC) participants and to senior citizens. The program enables eligible participants to purchase farm-fresh products that help meet their nutritional needs.

#### DHSS Strategies for Supporting the Intervention

1. Develop and expand partnerships within state government and among public and private sectors to maximize resources in promoting increased consumption of fruits and vegetables.
2. Identify effective communications strategies for promoting increased fruit and vegetable consumption for all segments of the population.
3. Integrate 5 A Day and other messages promoting an increase in fruit and vegetable consumption into existing nutrition and health programs throughout the state.
4. Assist communities in identifying and changing policies and environments so that all people have the opportunity to obtain affordable and appealing fruits and vegetables.
5. Encourage addition of knowledge-based questions on the state-added survey section of the BRFSS.
6. Identify and seek potential funding sources to support nutritional interventions.
7. Promote research into environmental influences on dietary behavior and behavior change.

#### **References:**

East Carolina University. *The ABC's Of the Dietary Guidelines for Americans, Science and Application*. Special-On-Line Course Offering during January-February 2001. In cooperation with the Center for Nutrition Policy and Promotion, USDA.

Hagdrup NA, Simoes EJ, Brownson RC. *Fruit and Vegetable Consumption in Missouri: Knowledge, Barriers and Benefits*. 1998. American Journal of Health Behavior, 22(2): 90-100.

Nutrition and Physical Activity Work Group. *Guidelines for Comprehensive Programs to Promote Healthy Eating and Physical Activity*. Human Kinetics, 2002.

U.S. Department of Agriculture (USDA) and Department of Health and Human Services (DHHS). *Dietary Guidelines For Americans, 2000*. Washington, D.C: USDA and DHHS, 2000.

# Healthy Adults - Sexually Transmitted Diseases

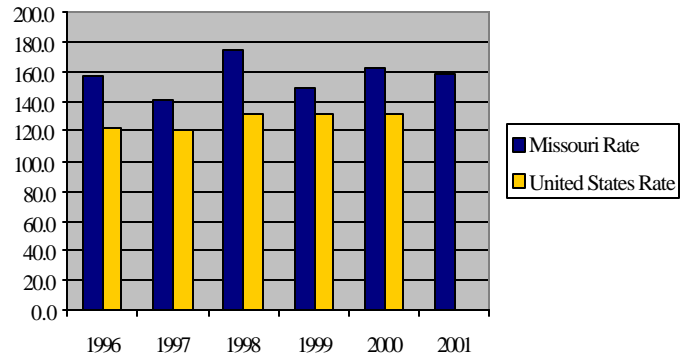
## Success Indicators:

- Rate of sexually transmitted diseases

### What are the trends?

Though chlamydia is the most common bacterial STD in the US today, it has been typically underreported because infection occurs without symptoms in 75% of women and 50% of men. According to the Centers of Disease Control and Prevention, the reported cases of chlamydia “are merely the tip of the iceberg.” The rate of gonorrhea cases has fluctuated somewhat in the past 5 years; however, young African-American women and men remain at highest risk. The numbers of cases of primary and secondary syphilis in Missouri are small in comparison to the other STDs, with the largest numbers reported from St. Louis City.

**Rate of Reported Gonorrhea  
Per 100,000 Population**

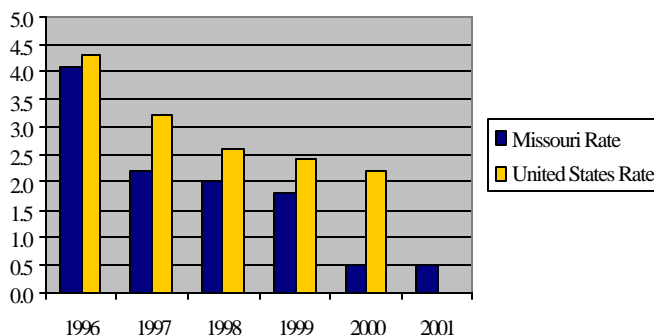


Source: Department of Health and Senior Services, Office of Surveillance, *Epidemiologic Profiles of HIV/STDs in Missouri*.

### How does Missouri compare to others?

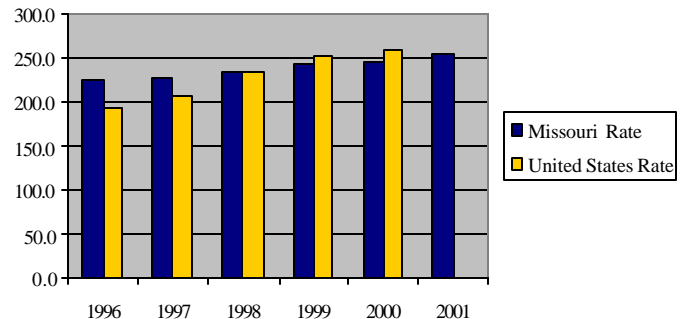
The rate for syphilis, gonorrhea and chlamydia for the state of Missouri and the United States is shown on the following graphs. In 2000, the most current year that national statistics were available, Missouri ranked 14<sup>th</sup> in rate of gonorrhea, 32<sup>nd</sup> in rate of syphilis and 24<sup>th</sup> in rate of chlamydia.

**Rate of Reported Primary and Secondary Syphilis  
Per 100,000 Population**



Source: Department of Health and Senior Services, Office of Surveillance, *Epidemiologic Profiles of HIV/STDs in Missouri*.

**Rate of Reported Chlamydia  
Per 100,000 Population**



Source: Department of Health and Senior Services, Office of Surveillance, *Epidemiologic Profiles of HIV/STDs in Missouri*.

## **Interventions that work:**

### ***Sexually Transmitted Disease Prevention and Control Programs***

Public health, in collaboration with other community partners, plays a central role in developing and implementing sexually transmitted disease prevention and control programs that have the following components:

- Disease surveillance
- Targeted outreach and screening of at-risk populations including sexually active adolescents and women under 24 years of age
- Adequate and timely treatment for infected persons
- Partner elicitation and notification
- Adequate and timely treatment of partners

In addition, health education programs for individuals to reduce risks by engaging in safer lifestyle practices, such as abstinence, maintaining mutually monogamous relationships, limiting sex partners, condom use, and obtaining regular medical care, are effective in preventing sexually transmitted diseases.

According to the Centers for Disease Control and Prevention Program Operations Guidelines for STD Prevention, STD programs exist in highly diverse, complex, and dynamic social and health service settings. The guidelines must be adapted to local area needs because there are differences in the:

- Availability of resources and range and extent of services among different areas,
- Level of various STDs and health conditions in communities,
- Level of preventative services available, and
- Amount of financial resources available to provide STD services

While local needs and expectations must be taken into account, all STD programs should establish priorities, examine options, calculate resources, evaluate the demographic distribution of the diseases to be prevented and controlled, and adopt appropriate strategies.

#### **DHSS Strategies for Supporting the Intervention**

1. Use disease surveillance to maintain an annual primary and secondary syphilis disease intervention index of 0.6 through 2005.
2. Through targeted outreach, increase the percentage of persons adequately treated for gonorrhea and/or chlamydia within seven days of assignment to a Disease Intervention Specialist from 62% (2001) to 75% by 2003.

#### **Reference:**

Program Operations Guidelines for STD Prevention, [www.cdc.gov/std/program](http://www.cdc.gov/std/program).

# Healthy Adults - Tuberculosis

## Success Indicators:

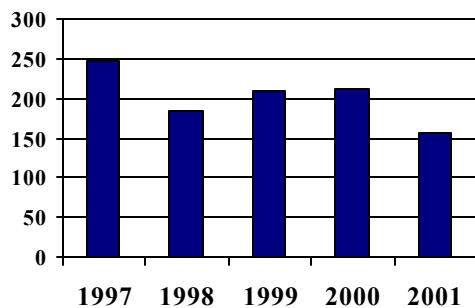
- Rate of tuberculosis

## What are the trends?

Missouri is seeing a general decline in the number of cases. Each individual diagnosed with tuberculosis disease has come into contact with 8-12 individuals who must undergo 6-9 months of treatment if they are found to be positive for the disease.

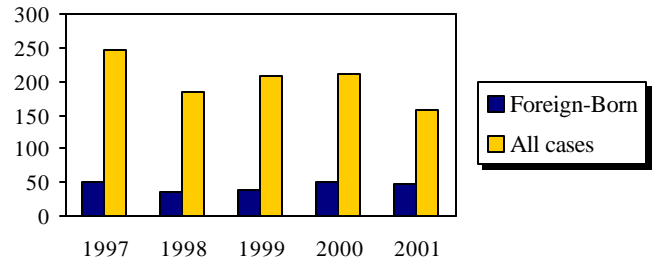
The number of foreign-born TB cases has been increasing statewide while there has been a general decline in number of cases overall. Foreign-born TB cases constituted 1/3 of all cases in 2001. Increased travel of people from countries with high rates of tuberculosis has been a major factor.

**Number of TB Cases in Missouri for Five Years - 1997-2001**



Source: Department of Health and Senior Services, Office of Surveillance.

**Number Foreign-Born TB Cases Compared to All Cases-Missouri 1997-2001**



Source: Department of Health and Senior Services, Office of Surveillance.

## How does Missouri compare to others?

Missouri is exhibiting the same general trends as seen nationally: decreasing overall cases, increases in the foreign-born cases, and the presence of multiple drug resistant forms of TB.

Some of our border states had the following rates:

State	1999 Cases	1999 Rates*	2000 Cases	2000 Rates*
Missouri	208	3.8	211	3.8
Arkansas	181	7.1	199	7.4
Illinois	825	6.8	743	6.0
Iowa	58	2.0	46	1.4
Kansas	69	2.6	77	2.9
Oklahoma	208	6.2	154	4.5

Source: Department of Health and Senior Services, Office of Surveillance.  
This table reflect a two year period, trends over a longer time show reductions.  
\*Rates per 100,000 people

### **Interventions that work:**

#### ***Tuberculosis Prevention and Control Program***

**T**uberculosis cases are managed through the “Tuberculosis Information Management System” or TIMS. This is a database system that is integrated with the Centers for Disease Control and Prevention information system, which allows for easy transfer of files. TIMS tracks active disease cases and their treatment status, thus monitoring the move toward the goal of completion of therapy.

#### **Case Management**

Case management is ensuring that medications are obtained through local health department facilities, monitoring for adherence to treatment and ensuring that patients are placed on appropriate treatment for TB or TB infection. The nurse case manager ensures that patients are appropriately isolated until they are considered not contagious and not capable of transmitting tuberculosis. Patients receive the 3 or 4 recommended medications for the treatment of TB and the appropriate 1 or 2 medications that are used to treat TB infection. Patients must be treated for at least 6 months, and ensuring adherence is the key to preventing the development of multi-drug resistant tuberculosis (MDR-TB). The case manager often consults with the primary care provider. In addition, the case manager may refer the patients to the appropriate source of care for diagnostic and evaluative services in the public or private sectors.

#### **Education/Behavioral Change**

Incentives used to motivate patients to take their TB medications is a strategy well documented in the literature. Incentives that have been used with patients include: the purchase of tokens to take the bus to a local health department or private physician to receive their TB medications; reimbursement for the purchase of gasoline to take them to the local health

department; dinner for the patient; assistance with paying the patient's rent for a limited period of time; etc.

#### **Public Health Follow-up**

Directly observed therapy (DOT) is used to ensure adherence with treatment. It decreases the threat of transmission and prevents the development of MDR-TB and improves completion of therapy rates. DOT consists of having a health care worker watch a patient take each dose of medication. The reason that this approach is so important is that most people do not take medications as well as they should, so non-adherence with treatment is a big challenge when people are supposed to take TB medications for at least six months. The use of DOT is effective in ensuring completion of treatment.

A contact interview and investigation are effective in stopping further transmission of tuberculosis and preventing the development of future cases of TB disease. Contacts to TB are identified through the contact interview process. Nurses and outreach workers in the local health departments make every effort to test, examine and treat those contacts as needed.

#### **Environmental Modification**

The use of environmental controls such as ultraviolet lights in high-risk settings are considered effective in controlling tuberculosis and reducing the opportunities for transmission of TB, especially in congregate settings such as correctional facilities, homeless shelters, etc.

#### **DHSS Strategies for Supporting the Intervention**

1. Prioritize and follow-up on those with risk factors for tuberculosis to prevent the development of tuberculosis.
2. Decrease transmission of Multiple Drug Resistant tuberculosis.

#### **Reference:**

*Essential Components of a Tuberculosis Prevention and Control Program, Recommendations of the Advisory Council for the Elimination of Tuberculosis, MMWR, Recommendations and Reports, September 8, 1995/44 (RR-11); 1-16.*



# Healthy Seniors

- Overview
- Success Indicators
- Interventions

Chronic Diseases and Immunization  
Home and Community Care



# Healthy Seniors - Overview

## Success Indicators:

- Rate of hospitalization due to the chronic diseases of heart disease, lung disease (COPD), and diabetes among Missouri senior adults
- Immunization rates among seniors for influenza and pneumonia
- Percent of unduplicated Missouri Care Options (MCO) screenings that result in authorization of state-funded home and community-based services

## Why is Senior Health important?

By 2030, the number of older Americans will have more than doubled to 70 million, or 1 in 5 Americans.

A large percentage of the senior population has chronic diseases.

- Four of the six leading causes of death among seniors are chronic diseases such as heart disease, cancer, stroke and COPD.
- Approximately 80% of all seniors have at least one chronic condition and 50% have at least two.
- African-American seniors have a higher incidence of lung disease, heart disease, and diabetes and significantly higher mortality rates as a result of these conditions, yet only about 47% of African-American seniors received the flu vaccine in 1998 compared to 66% of white seniors. In 1998, only about half as many African-American seniors received pneumonia vaccine compared to white seniors.

Chronic disease increases the need for higher levels of services.

- Chronic disease and related activity limitations increase the need for in-patient and extended care.
- Chronic conditions such as arthritis, diabetes, and heart disease often lead to declines in overall functioning and a reduced ability to remain in the community.
- Every year, chronic diseases account for more than 70% of the one trillion dollars the United States spends on health care expenditures.

Chronic disease produces a heavy economic burden on older adults due to long-term illness, diminished quality of life, and increased health care costs. Although the onset and severity of chronic disease increases with age, such conditions are not the inevitable consequences of aging. Thus, healthy adults can become healthy seniors.

## Why is Senior Health a critical issue in Missouri?

- Missouri ranks 10th in the nation in the percent of people 60 years of age and over.
- By 2025, Missouri's senior population is projected to be 1,625,394 or about 20% of Missouri's total population.

## Chronic Disease

- The risk of chronic disease increases with age, so growth in Missouri's senior population will ensure an increase in the prevalence of chronic diseases in the state.
- In 1999, Missouri spent \$3 billion on cardiovascular disease-related hospitalizations.
- In 2000, 15.6% of Missouri seniors age 65 and over reported a diagnosis of diabetes.
- While seniors and persons with disabilities comprised 21.5% of Medicaid enrollees in FY 2001, Missouri spent 69.6% of its Medicaid funding on these seniors and persons with disabilities.
- Tobacco use, lack of physical activity, unhealthy eating behaviors and obesity are major contributors to the number of Missourians with chronic conditions.

## Immunization

- In 2000, only 76.6% of individuals aged 65 and older were immunized against influenza and only 66.5% were vaccinated against pneumococcal disease.
- Pneumonia and influenza are among the top ten causes of death in Missouri annually (resulting in 1,678 deaths in 1999) and disproportionately affect seniors age 60 and over.
- There is currently no systematic approach to adult immunizations.
- Adults age 18-64 may not have health insurance or may have insurance that doesn't cover influenza and pneumococcal vaccines.

## Home and Community Care

- At any given time, about 5% of Missouri's senior population lives in a nursing home (49,185 in 2000).
- In FY 2000, the average annual nursing home cost per resident was \$32,385. Keeping seniors in the community and out of nursing homes decreases health care costs.
- The *Olmstead Decision* created the legal presumption that home and community care is preferable to institutional care.

## Healthy Seniors - Overview

Success Indicators	Healthy People 2010	2000 Baseline	2001 Target	2002 Target	2003 Target	2004 Target	2005 Target
<b>Hospitalization rates (per 10,000 population) due to chronic diseases among Missouri senior adults:</b>							
Diabetes with and without complications	25.7	42.0	39.9	38.0	36.1	34.8	33.1
Heart Disease (CVD)	657.7	1148.1	1090.7	1036.2	984.4	942.2	895.1
Lung Disease (COPD)	68.5	114.0	108.3	102.9	97.8	93	88.4
<b>Percentage of Missouri senior adults immunized:</b>							
Influenza (persons 65 years of age)	90%	76.6%	77.9%	79.2	80.6	81.9	83.3
Pneumococcal	90%	66.5%	71.2%	71.2%	73.5%	75.9%	78.3%
Percent of unduplicated Missouri Care Options (MCO) screenings that result in authorization of state-funded home and community-based services	N/A	31%	24%	30%	36%	39%	43%

### References:

*At a Glance: Healthy Aging: Preventing and Improving Quality of Life Among Older Americans*, Centers for Disease Control and Prevention, (2002).

Missouri Department of Health and Senior Services, Missouri Information for Community Assessment (MICA).

*Chronic Disease Notes and Reports-Special Focus: Healthy Aging*, Volume 12, No.3, Fall 1999, National Center for Chronic Disease and Prevention and Health Promotion, Centers for Disease Control and Prevention.

*Closing the Gap: Immunizations*, Office of Minority Health, U.S. Department of Health and Human Services, www.ohrc.gov.

*Report 2000 by the Missouri Department of Health*, Division of Chronic Disease Prevention and Health Promotion.

*Older Americans 2000: Key Indicators of Well-Being*, Federal Interagency Forum on Aging Related Statistics citing Centers for Disease Control and Prevention (1997) publication on *Unrealized Prevention and Opportunities: Reducing the Health and Economic Burden of Chronic Disease*.

*Unrealized Prevention Opportunities: Reducing the Health and Economic Burden of Chronic Diseases*, Centers for Disease Control and Prevention (November 2000).

*New Directions for State Long Term Care Systems: Second Edition*, American Association of Retired Persons, October 1998.

# Healthy Seniors - Chronic Diseases and Immunization

## Success Indicators:

- Rate of hospitalization due to the chronic diseases of heart disease, lung disease (COPD), and diabetes among Missouri senior adults
- Immunization rates among seniors for influenza and pneumonia

## What are the trends?

### In-Patient Hospitalization Rates (per 10,000) for Adults 65 years and older

Disease Specific	1996	1997	1998	1999	2000
Heart and circulation	1051.6	1071.7	1082.5	1101.6	1148.1
COPD and bronchitis	105.6	106.8	15.7	127.7	114.0
Diabetes without complications	0.7	0.8	1.0	1.2	1.1
Diabetes with complications	36.8	38.2	39.0	38.5	40.9

Source: Missouri Department of Health and Senior Services, Missouri Information for Community Assessment (MICA), 1996-2000.

## How does Missouri compare to others?

Pneumonia and Influenza are vaccine-preventable diseases. While Missouri's vaccination rates are comparable to surrounding states, the rates are still far below the Healthy People 2010 goal of 90% of seniors immunized.

### Influenza and Pneumococcal Vaccination Rates

State	Influenza	Pneumococcal
Missouri	68.4%	52.8%
Arkansas	67.3%	50.2%
Illinois	67.5%	47.4%
Iowa	69.6%	61.2%
Kansas	67.0%	55.1%
Oklahoma	71.8%	53.7%

Source: CDC Risk Factor Survey, 1999 BRFSS

### Missouri vs. United States Comparisons in Age-Adjusted Mortality Indicators 1998

	Missouri	U.S.	Difference
COPD	23.9	21.3	higher
Diabetes	13.3	13.6	same
Heart Disease	138.2	126.0	higher
Stroke	26.9	25.1	higher
Lung Cancer	44.9	38.2	higher
Asthma	1.3	1.4	same
Arthritis	1.0	NA	NA
Pneumonia & Influenza	14.4	13.2	higher

Source: Missouri Foundation for Health Report, Missouri Department of Health, July 2001.

Note: Rates are per 100,000 age-adjusted to U.S. 1940 Standard population except infant mortality, which is per 1,000 live births.

Significance Test done between Missouri and U.S. rates; difference is same if not significant.

\*U.S. 2000 standard population used for age adjustment and calculated per 100,000 males.

## Interventions that work:

### ***Community Initiatives and Programs that Promote Physical Activity, Nutrition, and Immunization for Seniors***

According to Assistant Secretary for Aging Josefina Carbonell, “No one is too old to enjoy the benefits of regular exercise. Healthy lifestyles, which include proper nutrition, are more influential than genetic factors in avoiding deterioration traditionally associated with aging.” The impact of *lack* of physical activity on medical costs is likely to grow as a result of the aging U.S. population, unless trends in physical activity change.

Evidence-based community preventive services that could be used to promote physical activity, nutrition, and immunization for seniors include:

#### Physical Activity —

- Clinicians are encouraged to work closely with patients to assess levels of physical activity and identify ways to overcome barriers to increasing those activity levels.
- Community-wide campaigns with messages regarding physical activity behavior for seniors promoted through television, radio, newspaper columns and inserts, and trailers in movie theaters.
- Individually-adapted health behavior change programs.
- Social support interventions in community settings that focus on changing physical activity behavior through building, strengthening, and main-

taining social networks that provide supportive relationships for behavior change. Strategies include creating new social networks in a social setting, setting up a buddy system, contracting with another person to complete specified levels of physical activity, or establishing walking groups or other groups to provide friendship and support.

- Creation of, or enhanced access to, places for safe physical activity combined with informational outreach activities (e.g. building trails or facilities or reduce barriers to such places).

**Nutrition —** Programs such as Older Americans Act Nutrition Programs, 5 A Day for Better Health and Farmers’ Market Nutrition Program.

**Immunization —** The Task Force on Community Preventive Services found that standing orders are effective in improving vaccine coverage among adults when used alone or as part of a multi-component intervention in a number of settings.

Standing orders involve programs in which non-physician medical personnel prescribe or deliver vaccinations to clients without direct physician involvement at the time of the visit. These programs are carried out in clinics, hospitals, and nursing homes.

Studies indicate that standing orders are particularly effective in improving the delivery of vaccines for influenza and pneumonia.

#### DHSS Strategy for Supporting the Intervention

1. Work with the providers of in-home services and the Area Agency on Aging to educate seniors on the importance of nutrition, physical activity, and immunization.

## References:

*Increasing Physical Activity: A Report on Recommendations of the Task Force on Community Preventive Services*. MMWR 2001;50(No. RR-18):1–16. Centers for Disease Control and Prevention, <http://www.thecommunityguide.org>.

Administration on Aging, U. S. Department of Health and Human Services, <http://www.aoa.dhhs.gov>.

*Serving Elders At Risk: The Older Americans Act Nutrition Programs, National Evaluation of the Elderly Nutrition Program, 1993-1995*, Administration on Aging, U. S. Department of Health and Human Services, <http://www.aoa.dhhs.gov/aoa/pages/nutreval.html>.

## Success Indicator:

- Percent of unduplicated Missouri Care Options (MCO) screenings that result in authorization of state-funded home and community-based services

## What are the trends?

From FY 1996 to FY 2001, the percentage of unduplicated MCO screenings resulting in home and community-based or residential care facility placement fluctuated.

**Percentage of Unduplicated MCO Screenings Resulting in Home and Community-Based or Residential Care Facility Placement**

	Screenings	*HCB	**RCF	Total	Percentage
FY '01	23,762	5,713	2,194	7,907	33.3%
FY '00	22,835	7,091	2,878	9,969	43.7%
FY '99	22,074	6,482	2,818	9,300	42.1
FY '98	22,017	5,999	2,534	8,533	38.8%
FY '97	21,753	4,043	2,594	6,637	30.5%
FY '96	19,603	4,399	1,983	6,382	32.6%

\*Home and Community Based Services

\*\*Residential Care Facility Placement

Source: Department of Health and Senior Services, Division of Senior Services, Research and Evaluation.

In FY 2001, the average annual nursing home cost per resident was \$35,607. In comparison, home and community-based services averaged \$4177 annual cost per client. Residential care averaged \$4,672 annual cost per resident.

Keeping seniors in the community and out of nursing homes decreases health care costs.

## How does Missouri compare to others?

There are no exact comparisons between Missouri and other states as other states don't have Missouri Care Options (MCO). However, other states' efforts to reduce nursing home admissions can be compared.

In 1995, Illinois mandated preadmission screening for all nursing home applicants regardless of income. Persons who didn't meet the state's standard of impairment could enter a nursing home if they used their own resources. The average Medicaid nursing home load dropped by more than 1,000 residents from FY '96 to FY '97.

In 1982, Oregon, through home and community services, made nursing home placement the placement of "last resort." From 1990 to 1996, Medicaid residents dropped by 900 despite the fact that number of Oregonians aged 85 and over increased 40% during that time period.

In 1993, Maine:

- 1) Limited nursing home care to those with the most severe medical needs or disabilities;
  - 2) Provided incentives to nursing homes to convert some beds to lower levels of care;
  - 3) Increased appropriations for home care services
  - 4) Developed additional residential care options.
- Result: The number of Medicaid residents dropped by almost 1000 from FY 1995 to FY 1997.

Also, some states used Medicaid Home and Community Based Care Waiver programs to reduce nursing home placements by:

- 1) Expanding the range of services covered by the waiver to include home modification, emergency response systems and nutrition programs;
- 2) Setting income eligibility standards for waiver services as high as 300% of the monthly SSI levels;
- 3) Offering waiver and personal care services in residential care/assisted living facilities; and,
- 4) Developing supportive housing care options.

Although Missouri has not had much success in expanding the HCB waiver, recent attention from the Missouri General Assembly on the social and fiscal benefits of investing in community-based services has resulted in appropriations to enhance the MCO function by creating a community counselor position to be placed in hospitals to assist in transitioning residents to the community from hospitals and nursing facilities. Those positions will be initiated in 2003.

## Interventions that work:

### *Integrated Home and Community-Based Services*

The U.S. Supreme Court's *Olmstead Decision* created the legal presumption that home and community care is preferable to institutional care. Consequently, Missouri is committed to increasing the number of seniors whose long-term care is provided in their homes and communities. The Missouri Care Options (MCO) program is a legislative initiative intended to ensure that adults who are facing decisions regarding long-term care are aware of information sufficient to exercise choice regarding the selection of their care.

MCO offers home and community long-term care services to adults 18 years and older who are Medicaid eligible, or potentially eligible, and in need of assistance. MCO also offers individuals who reside in long-term care facilities the option of home and community long-term care services if they qualify for care in a more independent setting. In-home services include:

- Help with activities of daily living such as grooming, bathing, dressing, eating
- Help with complex physical needs
- A companion to relieve family caregivers, giving them time to run errands or attend to personal needs
- Help with housekeeping, laundry, etc.
- In-home nursing care
- Supervised adult day health care programs
- Nutritious meals delivered to the home through arrangements with the Area Agencies on Aging

### DHSS Strategies for Supporting the Intervention

1. Discharge planning with hospitals to refer, inform and coordinate home and community services as options to nursing home care for seniors and their families.
2. Work with Division of Medical Services to expand the range of services covered by the waiver to include home modification, emergency response systems, transportation and nutrition programs.
3. Increase monitoring that focuses on quality of care versus paper compliance, implement outcome based contracts with more options for dealing with noncompliant providers, and require licensure for in-home service providers.

### References:

Centers for Disease Control and Prevention. *Increasing Physical Activity: A Report on Recommendations of the Task Force on Community Preventive Services*. *MMWR* 2001;50 (No. RR-18):1–16. Also see the *Guide to Community Preventive Services* Web site at <http://www.thecommunityguide.org>.

*Missouri Care Options Annual Report*, Missouri Department of Social Services, Division of Aging, May 2001.





# Environment that is Safe, Supportive and Conducive to a Healthy Lifestyle

- Overview
- Success Indicators
- Interventions
  - Child Care, Senior Care and Health Care Regulations
  - Health Professional Shortage Areas
  - Hazardous Substances
  - Safe Environment
  - Surveillance Systems



# Safe, Supportive Environment - Overview

## Success Indicators:

- Incidence of child abuse and neglect in regulated childcare facilities
- Incidence of elder abuse
- Percent of in-home service providers monitored that were sanctioned for quality of care issues
- Percent of Class I deficiencies issued to nursing homes
- Incidence of substandard hospital care due to accidental tissue penetrations or hemorrhages, foreign objects left in body, instrument failures, medication errors and sterilization failures as measures of medical errors
- Number of federally designated health professional shortage areas
- Incidence of poisoning from hazardous substances
- Number of sites participating in High Alert Surveillance System (HASS)

## Why is a safe, supportive environment important?

The health of every individual, regardless of the stage in the life cycle (infant, child, adolescent, adult or senior), is affected by the environment in which he or she lives. Years of healthy life and life expectancy can be decreased when people live in environments that are not conducive to a healthy lifestyle.

The health status of any population is determined by the “social, economic and physical environments, personal health practices, individual capacity and coping skills, human biology, early childhood development, and health services.” Any attempt to improve population health status must address, to some extent, each of these factors.

The premise that children should be safe in their child care facility, free from the risk of child abuse or neglect, is basic. And the quality of the care received by senior citizens is vital to their health and safety.

Maintaining a safe environment requires controlling or eliminating hazardous substance exposure and the health impact associated with a biological, chemical, or nuclear event.

## Why is a safe, supportive environment a critical issue for Missouri?

DHSS has the statutory responsibility for ensuring that services provided by hospitals, hospices, home health agencies, ambulance services, ambulatory surgical centers, persons and companies that handle controlled substances, child care providers, nursing facilities, residential care facilities, intermediate care facilities and adult day care facilities are safe and meet health standards.

- **Child Care—**
  - ✓ More than 200,000 Missouri infants and children are cared for daily in regulated child care facilities.
- **Senior Care —**
  - ✓ Missouri ranks 10<sup>th</sup> in the nation in percent of population 60 years of age and over. Per the 2000 census, there are 983,704 residents age 60 and over in the state — 17.6% of Missouri’s total population.
  - ✓ By 2005, the 60+ age cohort is projected to be 1,172,336, and of those, 121,383 will be age 85 and over.
  - ✓ In 2025, Missouri’s population of seniors is projected to be almost 1,625,394, or approximately 20% of Missouri’s total population.
  - ✓ At any given time, about 5% of Missouri’s senior population (49,185 in 2000) lives in a nursing home.
  - ✓ Missouri has 477 skilled nursing facilities, 64 intermediate care facilities, 660 residential care facilities, 18 intermediate care facilities/mental retardation, and 71 adult day care facilities regulated by the DHSS.
  - ✓ There are now 187 home health agencies and 70 hospices licensed or certified by the DHSS. DHSS also contracts with or enrolls 375 in-home service provider agencies, 566 residential care facility (RCF) personal care (PC) providers, 11 Social Services Block Grant counseling providers, and 44 Medicaid adult day health care programs.
- **Health Care —**
  - ✓ More than 750,000 people are cared for in Missouri’s 143 hospitals and 51 ambulatory surgical centers annually.

## Safe, Supportive Environment - Overview

- ✓ Adequate systems of care, with appropriate staffing levels of health care practitioners, are essential to the early detection and treatment of disease in order to lessen the impact on the health and financial status of individuals. A national standard for determining the status of the primary care, dental and mental health services delivery systems is the designation of Health Professional Shortage Area (HPSA).
- **Safe Environment**—Extended exposure to certain hazardous substances can lead to chronic adverse conditions of many bodily systems and illnesses, such as various cancers, kidney disease, liver disease and damage to the central nervous system.
- ✓ Acute exposures to high levels of hazardous substances can lead to various illnesses and even death. As a result, there are increases in health care costs and psychological effects of the poisoned individuals and their families. If the exposure came from a hazardous waste site near a property, decreased property values may also occur and cause economic effects to the family.
- ✓ Surveillance systems provide the ability to quickly detect health changes that may be associated with a biological, chemical or nuclear event. In 2001, active and passive surveillance systems were combined into the High Alert Surveillance System (HASS). HASS actively looks for signs and symptoms of illness or conditions typically associated with chemical, biological, and radiological agents. It also determines the frequency of specific syndromes occurring in otherwise healthy populations in order to identify increased frequency or unusual occurrences of syndromes or diseases.

(References in the plan to other elements necessary for a safe, supportive environment conducive to a healthy life-style can be found on pages 17, 21, 26, 27, 29, 31, 33, 42, 45, 47, 51, 59, and 60.)

Success Indicator	Healthy People 2010	2000 Baseline	2001 Target	2002 Target	2003 Target	2004 Target	2005 Target
Incidence of child abuse and neglect in regulated child care facilities	N/A	45	43 (actual)	41 (projected)	39	37	35
Incidence of elder abuse	N/A	9,870	9,752 (actual)	9,700 (projected)	9,700	9,700	9,700
Percent of Class I deficiencies issued to nursing homes	N/A	4.5%	2.3% (actual)	2.3% (projected)	2.3%	2.3%	2.3%
Percent of in-home service providers monitored sanctioned for quality of care issues	N/A	N/A	N/A	N/A	Establish Baseline	N/A	N/A
Incidence of substandard hospital care (due to accidental tissue penetrations or hemorrhages, foreign objects left in body, instrument failures, medication errors and sterilization failures as measures of medical errors)	N/A	2,570	2,696 (projected)	2,828 (projected)	2,967	3,112	3,264
Number of federally designated geographic health professional shortage areas	N/A	38	38 (actual)	36	35	34	33
Incidence of poisoning from hazardous substances	N/A	49	167 (actual)	68 (projected)	48	46	44
Number of sites participating in High Alert Surveillance System (HASS)	N/A	N/A	N/A	412	575	625	700

### References:

Strategic Policy Directorate of the Population and Public Health Branch, Health Canada, (2001) *The Population Health Template: Key Elements and Actions That Define A Population Health Approach*, Public Health Branch, Health Canada.

[www.aoa.dhhs.gov/Census2000/stateprofiles/ageprofile-states.html](http://www.aoa.dhhs.gov/Census2000/stateprofiles/ageprofile-states.html).

## Safe Supportive Environment - *Child Care*

### Success Indicators:

- Incidence of child abuse and neglect in regulated childcare facilities

### What are the trends?

- The Bureau of Child Care received 1,825 complaints about regulated child care facilities in FY 2001.
- Of this number, 423 involved allegations of child abuse/neglect, and were co-investigated with staff from the Division of Family Services.
- There were 43 substantiated child abuse/neglect findings in regulated child care facilities, in addition to violations of licensing standards identified in each of those investigations.

CHILD CARE	FY '95	FY '96	FY '97	FY '98	FY '99	FY '00	FY '01
Number of regulated child care providers	4,834	4,916	4,920	4,912	4,625	4,649	4,630
Number of complaints in regulated child care facilities	N/A	N/A	N/A	N/A	1,919	2,086	1,825
Number of co-investigations involving allegations of child abuse/neglect in regulated child care facilities	N/A	N/A	N/A	408	353	343	423
Incidence of substantiated child abuse and neglect occurring in regulated child care facilities	N/A	N/A	N/A	60	57	45	43

Source: Missouri Department of Health and Senior Services, Division of Health Standards and Licensure, Bureau of Child Care.

## Safe, Supportive Environment - *Senior Care*

### Success Indicators:

- Percent of in-home service providers monitored that were sanctioned for quality of care issues
- Incidence of elder abuse
- Percent of Class I deficiencies issued to nursing homes

### What are the trends?

- In FY 2001, the reports of abuse/neglect/exploitation (A/N/E) of the elderly and adults with disabilities in the home and community setting increased for the fifth year in a row. Of the A/N/E investigations completed in FY 2001, nearly 75 percent were found to be either supported by a substantial amount of evidence or were probable or likely. The remaining investigations did not find evidence to support the reported allegations.
- In FY 2001, the reports of abuse/neglect (A/N) of the elderly and adults with disabilities in institutional settings decreased 27% from FY 2000. The 576 reported cases was the fewest reported in at least seven years. Of the A/N investigations completed in FY 2001, 27.5% were found to be valid. The remaining investigations were found to be invalid or could not be verified.
- The number and percent of Class I deficiencies issued to nursing homes has decreased each year since FY 1999. However, the total of all classes of deficiencies issued each year has increased by approximately one third in FY 2000 and FY 2001.

<b>SENIOR CARE</b>	<b>FY '95</b>	<b>FY '96</b>	<b>FY '97</b>	<b>FY '98</b>	<b>FY '99</b>	<b>FY '00</b>	<b>FY '01</b>
<b>Elder Abuse-Home or Community Setting</b>							
Reports of A/N/E in home or community setting*	12,110	11,976	12,623	13,386	14,099	14,732	15,718
Completed investigations of home and community A/N/E*	11,019	10,619	10,958	11,761	12,467	12,572	12,773
Reason to Believe	6,347 (57.6%)	5,919 (55.7%)	6,432 (58.7%)	6,630 (56.4%)	6,851 (55.0%)	7,169 (57.0%)	7,204 (56.4%)
Suspected	2,375 (21.6%)	2,298 (21.7%)	2,255 (20.6%)	2,581 (21.9%)	2,687 (21.5%)	2,447 (19.5%)	2,363 (18.5%)
<b>Elder Abuse - Institutional Setting</b>							
Reports of A/N in long-term care facility*	656	886	832	716	683	787	576
Completed investigations of A/N in long-term care facility*	590	868	851	698	616	922	672
Valid	148 (25.1%)	237 (27.3%)	256 (30.1%)	154 (22.1%)	185 (30.0%)	254 (27.5%)	185 (27.5%)
<b>Class I Deficiencies</b>							
Number and Percent of Class I deficiencies issued to nursing homes	N/A	N/A	N/A	N/A	124 (9.4%)	79 (4.5%)	54 (2.3%)

\*Includes seniors and adults with disabilities.

Source: Missouri Department of Health and Senior Services, Division of Health Standards and Licensure, Section for Long-Term Care Regulation; Missouri Department of Health and Senior Services, Division of Senior Services.

Note: FY '02 data will be available in September '02.

### Success Indicator:

- Incidence of substandard hospital care due to accidental tissue penetrations or hemorrhages, foreign objects left in body, instrument failures, medication errors and sterilization failures as measures of medical errors

### What are the trends?

The number of hospital readmissions within 48 hours of discharge remained fairly stable from 1996 through 1999. However, an increase of nearly 20% occurred in 2000. In contrast, the number of hospital admissions within 48 hours after an emergency department visit has increased each year since 1998.

In 2000, the Institute of Medicine (IOM) reported that preventable medical errors in United States hospitals might result in 44,000 to 98,000 deaths each year. Using the lowest estimate, medical errors in hospitals becomes the eighth leading cause of death. More people die of preventable medical errors than motor vehicle accidents (43,458), breast cancer (42,297), or AIDS (16,516) each year.

One type of medical error, medication-related error, does not always result in actual harm to patients, but those that do cause harm are costly. The IOM report states that two out of every 100 admissions experience a preventable adverse drug event resulting in an increased hospital cost of \$4,700 per admission. In 2000, there were 680,571 hospital admissions in Missouri. Using the information above the department estimates that medication errors increased hospital costs by \$63,970,000 in Missouri in 2000.

Since hospitals represent only a part of the health care delivery system, one can assume the actual number of medical errors across the health care system, including the home care system, is higher.

Although Missouri does not currently have a mechanism for collecting data on all medical errors, the department has targeted information that can further describe the problem. Complaints received from consumers regarding care provided by DHSS-regulated health care providers can be used to help describe the problem. The following chart shows the increase in the total number of complaints received over the last 5 years.

**Number of Consumer Complaints  
Regarding Care\***

Provider	1997	1998	1999	2000	2001
Hospitals	130	100	243	409	453
EMS <sup>1</sup>	**	48	49	74	54
Home Health	**	44	51	47	56
Other Medical Facilities <sup>2</sup>	**	**	**	19	24

Source: Missouri Department of Health and Senior Services, Division of Health Standards and Licensure.

\*Care provided by DHSS-regulated health care providers

\*\*Not available

<sup>1</sup> This number reflects a combination of investigated complaints concerning ambulance services, paramedics and EMT's.

<sup>2</sup> This number reflects complaints received concerning abortion clinics, birthing centers, ambulatory surgical centers, end-stage renal disease facilities, rural health clinics, and laboratories.

## **Interventions that work:**

### ***Enforcement of the Rules and Regulations (both state and federal) Pertaining to Child Care, Senior Care and Health Care***

One of the main interventions in securing an environment that is safe, supportive and conducive to a healthy lifestyle for all Missourians is enforcement of the rules and regulations (both state and federal) pertaining to child care, senior care, and health care.

Enforcement begins with ensuring that the necessary statutes, regulations, policies and procedures are in place to allow adequate enforcement activities. The major components of enforcement of state and federal rules and regulations include:

- Licensure and inspection
- Follow up on complaints
- Quality monitoring and training

Maintaining good communication with staff, providers, and the public is an important component of enforcement. Staff must receive thorough and timely training on rules and regulations to ensure complete and consistent inspection, licensing, and investigative activities. Providers must be kept informed of changes in rules and regulations, they must be appropriately informed in a timely manner of deficiencies and corrective action that is needed, and they must be provided information on quality of care improvement topics. It is vitally important that the public has access to information about providers, and rules and regulations so they can make informed decisions. Consumers must also know whom to contact if

they need additional information or if they want to communicate a concern about a regulated provider, whether it be child, senior, or health-care related.

House Bill 316 and Senate Bill 326 passed in 1999 by the Missouri General Assembly require development and implementation of a new comprehensive quality monitoring and training system, including training requirements relating to long-term care providers. Senate Bill 48 passed by the Missouri General Assembly in 2001 expands the Family Care Safety Registry to include additional in-home service providers and expands background check reporting information from other state agencies.

### **DHSS Strategies for Supporting the Intervention**

1. Develop and implement methods for obtaining feedback from consumers on the services of providers regulated by the DHSS.
2. Develop and implement consistent methods for assignment and tracking of complaint investigations to ensure timely response.
3. Establish a division-level review process for complaint investigation results that may involve multiple programs.
4. Review and analyze statistical information to assist in evaluating the success of enforcement and communications efforts including:
  - data on number of hospital readmissions within 48 hours of discharge from inpatient stay
  - number of hospital admissions within 48 hours of emergency department visit to inform quality of care.
5. Identify and investigate potential funding sources for establishing a Medical Errors Task Force to study the impact of medical errors, to develop a reporting system, to establish rules for reporting all medical errors to DHSS, and to identify key indicators for assessing trends and tracking improvements.
6. Identify funding for full implementation of legislation.

### **References**

House Bill 316, 1999, Missouri General Assembly  
Senate Bill 326, 1999, Missouri General Assembly  
Senate Bill 48, 2001, Missouri General Assembly

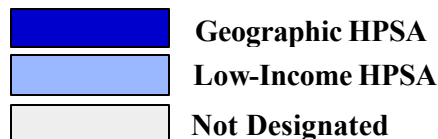
**[Click here for action plans.](#)**



### Success Indicators:

- Number of federally designated health professional shortage areas

### Designations as Primary Care Health Professional Shortage Areas (HPSA)



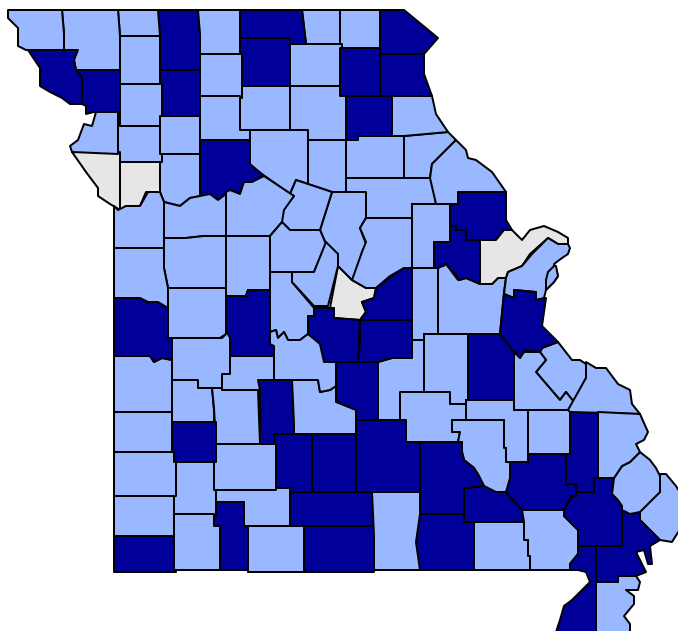
### What are the trends?

Although the number of physicians and especially primary care physicians has increased, the number of federally designated health professional shortage areas (HPSAs) has also increased. These seemingly conflicting facts indicate improvements in primary care access for people in general, while the lack of access for low-income citizens is increasing.

There are two different types of HPSAs, geographic and low-income. Geographic HPSAs are based on the ratio of primary care physicians to the general population, while low-income HPSAs are based on the amount of care provided to Medicaid and uninsured patients.

In the past five years the number of geographic HPSAs has decreased in Missouri by 25%. However, the number of counties in the state designated as low-income HPSAs has increased by more than 1,000%. The Primary Care HPSA map shows the distribution of these two types of HPSAs in Missouri.

Year 2001





### **Interventions that work:**

#### ***Comprehensive Approach Focusing on Eliminating or Reducing Primary Care Health Professional Shortage Areas***

Public health, in collaboration with other state and local partners, plays a central role in developing and implementing the following interventions focused on eliminating or reducing Primary Care Health Professional Shortage Areas:

- Developing community-based systems of care;
- Recruitment of health professional students from areas of need;
- Provision of incentives to health professional students to return to underserved areas; and
- Provision of clinical training experiences in underserved communities

#### DHSS Strategies for Supporting the Intervention

1. Expanding and enhancing health professional incentive programs to include student financial aid, loan repayments, and direct subsidies in order to increase the number of participating primary care professionals.
2. Developing the primary care component of the Missouri Health Care Workforce model, to determine need for and supply of population-based health care services.
3. Increasing the number of community-based health care delivery systems that accept Medicaid, Medicare assignment and providing sliding fee scales to increase access to services for the underinsured and uninsured populations.
4. Developing and implementing a tool to prioritize Missouri communities based on need for health care services and the infrastructure needs to obtain those services.
5. Coordinating with the Department's community development initiatives to build support for community based systems of care on an ongoing basis.

#### **References:**

Rabinowitz, Howard K, et al, *Critical Factors for Designing Programs to Increase the Supply and Retention of Rural Primary Care Physicians*. JAMA, Vol 286, No. 9, September 5, 2001, pp. 1041-1048.

Dievler, Anne, Giovanni, Terence, *Community Health Centers: Promise and Performance*. Medical Care Research and Review, Vol 55, No. 4, (December 1998) 405-431.

Academy for Health Services Research and Health Policy, *Teaming Up to Take on Uninsurance, Communities Partner with States to Expand Coverage and Services*.

## Safe, Supportive Environment - *Hazardous Substances*

### Success Indicators:

- Incidence of poisoning from hazardous substances (acute chemical, heavy metal, lead and pesticides)
- Number of sites participating in High Alert Surveillance System (HASS)

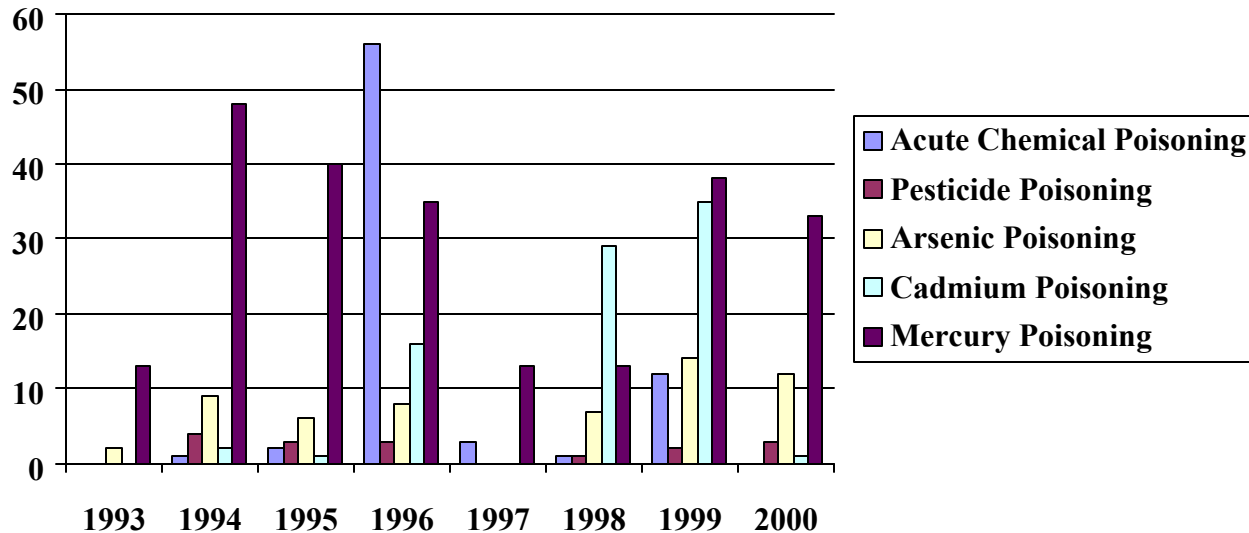
The High Alert Surveillance System (HASS) has been in place and operable for more than eight months, but at least one full year of compiling data is needed before the department will have adequate information to demonstrate trends.

Even with a short operation time, HASS has been able to identify high school absenteeism, influenza outbreaks and other indicators, which have led to early interventions being used and the spread of these illnesses being contained. HASS data is critical to the state's rapid response in the event of a biological, chemical or nuclear event.

### What are the trends?

The following table shows the number of acute chemical, pesticide, arsenic, cadmium and mercury poisonings from 1993 through 2000. In general, trends are not apparent and the numbers of cases reported are relatively low.

**Cases of Acute Chemical Poisoning, Pesticide Poisoning, Arsenic Poisoning, Cadmium Poisoning and Mercury Poisoning, Missouri, 1993-2000**



Source: Department of Health and Senior Services, Division of Environmental Health and Communicable Disease Prevention, Office of Surveillance.

# Safe, Supportive Environment - *Safe Environment*

## Interventions that work:

### *Environmental Management*

**T**he purpose of environmental management is to determine the source(s) of exposure to hazardous substances or biological contamination and identify control measures.

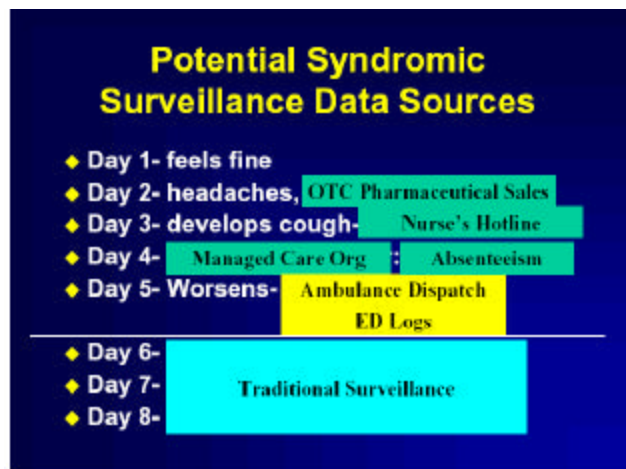
Hazardous substance contamination: environmental contamination due to hazardous waste sites. Successful interventions range from residential soil replacement and health education in lead-contaminated communities to carbon filtration and other treatment systems on private drinking water wells contaminated with volatile organic chemicals. Prior to these interventions, public health assessment activities should regularly take place (e.g., annual private well sampling around hazardous waste sites).

Biological contamination or threats: Medical research has revealed decreased morbidity and mortality of life threatening illnesses if intervention occurs in the syndromic phase of the illness. Promoting awareness and education of both the threat of bioterrorism and the need for participation in both active and passive surveillance statewide motivates hospitals, emergency rooms, outpatient facilities, physicians, schools and others to become reporting sites.

The majority of states across the nation have developed active surveillance systems in direct response to the events of September 11, 2001. Missouri is one of several public health agencies such as New York City and Arizona that has developed a more specific syndromic surveillance system per recommendations of the Centers for Disease Control and Prevention.

Internal quality assurance methods such as identifying inactive surveillance sites and working with district and LPHA staff to reactivate them, retaining ac-

tive sites and initiating new sites across Missouri must be done continuously. Only through collaboration with local, state and federal agencies will cohesive plans for disaster responses (natural or man-made) be developed.



### DHSS Strategies for Supporting the Intervention

1. Respond to public inquiries on hazardous substances and environmentally induced human diseases/conditions.
2. Assess human exposure to substances at hazardous waste sites.
3. Ensure 100% of the Local Public Health Agencies (LPHAs), 75% of the Hospitals and 50% of the sentinel active surveillance system sites in Missouri are active with HASS.
4. Detect and initiate timely response to chemical, biological and radiological terrorist events at the earliest possible point.
5. Ensure that each region will have a regional bioterrorism plan that is approved by the DHSS.

### References:

Centers for Disease Control and Prevention, and U.S. Environmental Protection Agency accepted practices.

## **Interventions that work:**

### ***Population-Based Surveillance Systems***

Surveillance systems within the Missouri Department of Health and Senior Services are set up to track many diseases and health conditions, such as communicable diseases, cancer, lead poisoning, sexually transmitted diseases, behavioral risks, birth defects, head injuries, etc.

These systems protect Missourians by enabling the appropriate response to identify high risk populations and threats to the population. These systems are dependent upon working in partnership with private medical care providers.

Disease surveillance systems provide for the ongoing collection, analysis, and dissemination of data to prevent and control disease. Disease surveillance data are used by public health professionals, medical professionals, private industry, and interested members of the general public in numerous ways to:

- identify cases for investigation and follow-up
- estimate the magnitude of a health problem and follow trends in its incidence and distribution
- formulate and evaluate control and prevention measures
- detect outbreaks or epidemics and generate appropriate interventions

- monitor changes in infectious agents (e.g., antibiotic resistance, emerging infections)
- facilitate epidemiologic and laboratory research
- detect changes in health practice (e.g., impact of use of new diagnostic methods on case counts)
- facilitate planning (e.g., allocation of program resources, policy development)

#### **DHSS Strategies for Supporting the Intervention**

1. Create electronic transfer of data from laboratories and medical care providers to the department.
2. Improve the feedback reports to the providers.

#### **References:**

Missouri Department of Health and Senior Services, Center for Health Information Management and Evaluation.

Missouri Department of Health and Senior Services, Office of Epidemiology.

A color version of the Strategic Plan is available on the Department of Health and Senior Services' website:

[www.dhss.state.mo.us](http://www.dhss.state.mo.us)

Tables and charts may not be accurately displayed on black and white copies of the plan.

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